

NetworkWorld

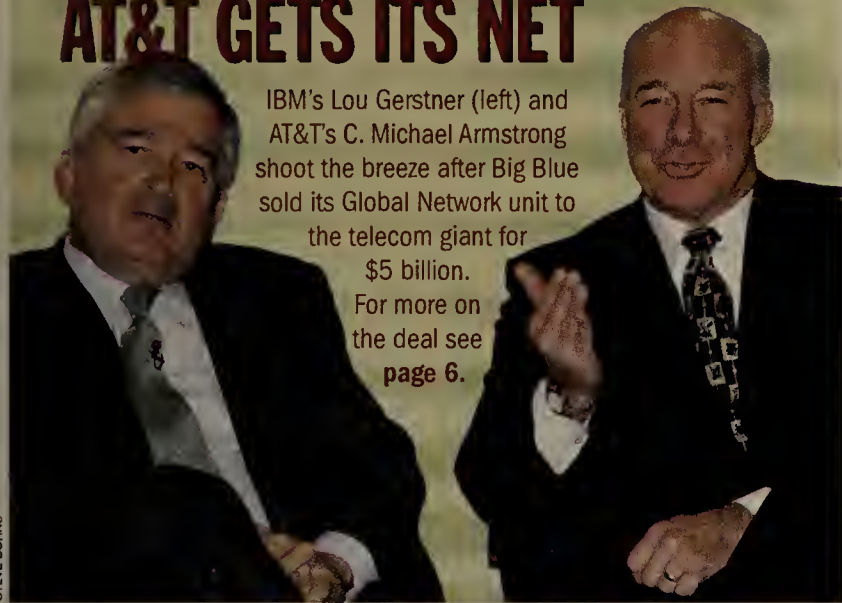
THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING



Companies are giving the operating system a chance to shine. **Page 24.**

AT&T GETS ITS NET

IBM's Lou Gerstner (left) and AT&T's C. Michael Armstrong shoot the breeze after Big Blue sold its Global Network unit to the telecom giant for \$5 billion. For more on the deal see **page 6.**



STEVE BORNIS

3Com revs up new switch

By Jim Duffy
San Francisco

3Com will soon announce a scaled-down version of the CoreBuilder 9000, the company's top-of-the-line Gigabit Ethernet and ATM switch.

The new seven-slot switch follows 3Com's September introduction of the first version of the CoreBuilder 9000, a 16-slot offering designed for backbone networks and data

See 3Com, **page 10**



MORE ON 3COM INSIDE: **PAGE 10.**

- 3Com-Siemens form LAN telephony venture.
- Q&A: 3Com CEO Eric Benhamou's take on the deal and other topics.

Online:

- An expanded version of our Benhamou interview.
- CoreBuilder 9000 overview. www.nwfusion.com



Former Cascade bigwigs resurface at IP start-ups

By Tim Greene

That giant sucking sound you heard during the past year or so was the brain power streaming out of Cascade Communications in the wake of its acquisition by Ascend.

Last week, a handful of former key Cascade executives re-emerged in top jobs at three well-heeled start-ups. All three companies are shooting to make all-IP carrier networks

See Cascade, **page 65**

Qwest throws down pricing gauntlet

Aggressive IP carrier details ambitious frame relay, ATM enterprise service plans.

By David Rohde
Arlington, Va.

For a year now, upstart carrier Qwest Communications has seemed the epitome of hype — an IP renegade with apparently little more to offer users than a consumer-oriented voice-over-IP service in a handful of cities.

That's all about to change.

Qwest revealed to *Network World* last week a new line of enterprise services in the basic categories favored by the Big 3 carriers: frame relay, ATM, private lines and Internet access.

But Qwest will offer some major twists: pure usage-based billing, voice carriage over pack-

et networks, souped-up service-level agreements (SLA) and — true to CEO Joe Nacchio's word — much lower prices.

Qwest's account representatives have marched into the

field with eye-popping data-service deals. The company told *Network World* that it is offering T-1 frame relay at nearly \$1,100 per month less

See Qwest, **page 64**

NACCHIO'S REVENGE

Former AT&T honcho Joe Nacchio's company, Qwest, will offer fast-packet port prices that are so much lower than AT&T's that T-3 ATM won't cost much more than what AT&T charges for T-1 frame relay.



	Qwest	AT&T
56K bit/sec frame relay:	\$190	\$295
T-1 frame relay:	\$1,595	\$2,690
T-3 ATM:	\$3,190	\$12,650

Note: Prices are before discounts. AT&T ATM service includes Visual Networks' ATM analysis service.

SOURCES: AT&T, QWEST

PC titans side with Bells on DSL

By Tim Greene

Washington, D.C.

At the possible risk of crippling telephone competition, computer industry heavyweights are pressuring the government to ease telecom regulations so regional Bell operating companies can more quickly deploy

high-speed services.

If adopted by the Federal Communications Commission, the proposal from vendors including Compaq, Intel, Microsoft and GTE could hurt start-up digital subscriber line (DSL) carriers that are in the midst of rollouts, critics say.

The computer consortium is focusing on DSL services because the technology is a fast, inexpensive way to boost access speeds.

New carriers specializing in DSL say the proposal would give RBOCs an inordinate

See Proposal, **page 15**

CUT COSTS, NOT CORNERS:

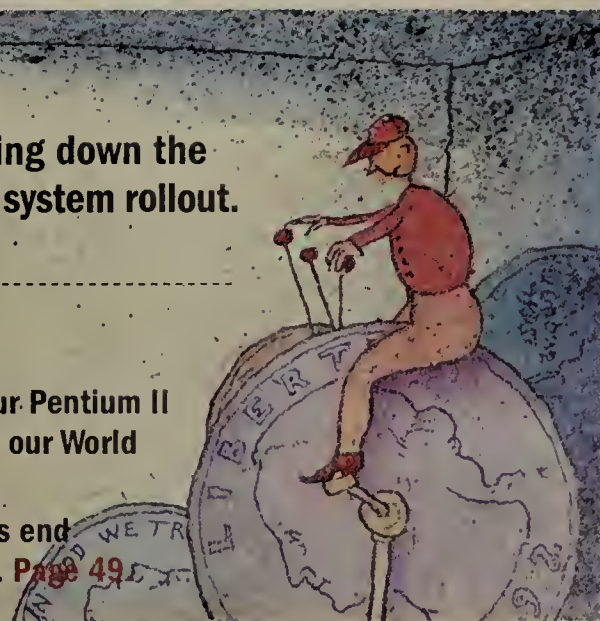
Preparation is the key to keeping down the cost of a network management system rollout. **Page 45.**



REVIEWS:

Honor systems: Two of four Pentium II servers we tested earned our World Class Award. **Page 51.**

Save it on Rio: DataChannel's Rio lets end users help build a corporate intranet. **Page 49.**



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SHIVA DELIVERS VPNs.

AND A HISTORY OF BUSINESS CONNECTIVITY TO BACK IT UP.

Mention connectivity these days and you can't help but notice the enthusiasm of everyone eager to implement a VPN. And why not? Taking the promise of VPNs at face value, it would be hard to find a better way to ensure security, improve network connections, and increase throughput capacity, all while dramatically reducing your costs. You, however, need accountability, not promises. So which VPN provider do you put your faith in? Well, if history is any guide, it could only be Shiva. You see, connectivity has always been our business. So it's no wonder we have the world's largest installed base of VPN systems. In fact we're so confident in our solutions, we guarantee them. To learn more about the Shiva Guarantee, call 1-800-97-SHIVA or visit us at <http://vpn.shiva.com>. And while you're there, be sure to check out our VPN Resource Center. You'll find white papers, reviews and user stories all designed to help you implement a powerful VPN solution for your business. Guarantee the success of your VPN. With Shiva.



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TAKING ACTION

Matt Lampe, director of enterprise technology for the City of Seattle, is changing his recruiting tactics to better compete with the private sector. Page 53.

KATHLEEN KING

WHO NEEDS STACKABLES?

Cisco rolls out fixed-configuration and chassis-based switches. Page 19.



LONG DISTANCE OR DIE

Bell Atlantic's Tom Tauke says the company must offer long-distance service in 1999. Page 33.



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To quickly get to any online info referenced in *Network World*, enter its DocFinder number in the input box on the home page.



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This Week

Only on Fusion

Bah, humbug! Are your mail servers grinding to a halt because of all those multimegabyte animated Christmas cards users are sending? What are you doing about it? Share horror stories and tips in our new forum. **DocFinder: 9534**

Keeping Current. Fred McClimans gets into the holiday spirit as well, with a look at Christmas shopping myths. **DocFinder: 9536**

Novell. Are directories really enough to keep Novell going? Read what Features Editor Paul Desmond has to say in this week's Water Cooler column, then add your opinion. **DocFinder: 9535**

IP telephony. See what Tom Evslin, CEO of ITXC Corp., wrote on the topic in our Spotlight forum last week. **DocFinder: 9426**

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FEATURES

Cut costs, not corners

Preparation is the key to keeping down the cost of a network management system rollout. Page 45.

REVIEWS

Save it on Rio: DataChannel's Rio lets end users help build a corporate intranet. Page 49.

Honor systems: Two of these four Pentium II servers earned our World Class Award. Page 51.

News briefs, December 14, 1998

You're a mean one, Mr. Ebbers

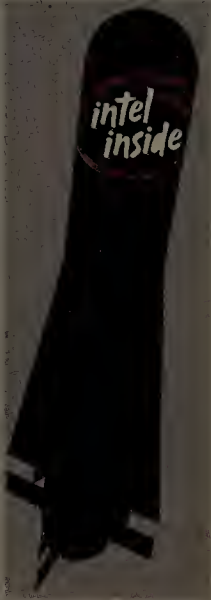
■ As expected, MCI WorldCom played the Grinch late last week as the company announced it would lay off 2,000 employees across the U.S. by Dec. 31 (NW, Dec. 7, page 1). Most of the cuts are a result of reducing duplicate jobs, primarily in the network operations area, according to an MCI WorldCom spokeswoman. While rumors circulated that the carrier would cut as many as 6,000 more jobs, MCI WorldCom says additional layoffs are not expected. But if the company's revenue fails to increase by 18%, as CEO Bernie Ebbers expects it will, then all bets are off.

Blame it on Cisco

■ The six-hour blackout that hit San Francisco last Tuesday did not darken the spirits of 3Com Chairman and CEO Eric Benhamou. During a keynote address to 3Com users at the company's Networks3 conference, Benhamou was continually interrupted by fire alarm tests and hotel staffers who were belting out instructions over the St. Francis Hotel's public address system. At one point, Benhamou jokingly blamed the blackout and resulting confusion on a faulty Cisco router.

Intel in space

■ Intel, in a holiday giving mood, last week said it will license the Pentium processor design to the Department of Energy, royalty-free, to help develop customized, radiation-proof processors for use in satellites, space vehicles and missile defense systems. Specifically, Intel will license Pentium technology to the department's Sandia National Laboratories in Albuquerque, N.M., which handle microelectronics research and development. Sandia will be working with unnamed semiconductor manufacturers to produce the chips, which will be made available only to U.S. companies in three years.

**The post-Postel era begins**

■ The Internet Society last week named John Gage, director of the Science Office at Sun, to its board of trustees. Gage will complete the term of the late Jon Postel. Gage is responsible for Sun's relationships with scientific and technical organizations, international public policy, government relations in the areas of scientific and technical policy, and alliances with the world's leading research institutions.

I'll have a Linux and a couple of lagers, please

■ In what some may see as the ultimate combination of work and fun, users of the Linux operating system are being offered a chance to learn more about it next August while hiking the Bavarian Alps. Interested attendees are being told to bring a laptop computer and a pair of comfortable hiking boots to the week-long gig, which will likely take place from Aug. 9 to 15. Participants will take part in outdoor Linux lectures by day and make frequent nighttime visits to "Bavarian brew pubs," according to information posted on a special Web page set up for the occasion. For more information, point to www.electriclchen.com/linuxbierwanderung.

Hello, I must be going

■ Electronic Data Systems last week announced that it has snagged Cable & Wireless CEO Dick Brown to fill EDS' vacant chairman and CEO positions. Brown, who will assume the new roles on Jan. 15, replaces Les Alberthal, who in August announced he would retire from the troubled IT services and consulting firm once a replacement had been found. EDS has been on rocky financial ground ever since it was spun off from parent company General Motors Corp. in 1996. It was not immediately clear who would replace Brown at Cable & Wireless.

AT&T buys global presence

Acquisition of IBM net proves Armstrong will not let AT&T fade to No. 2.

By Denise Pappalardo
and David Rohde
New York

AT&T is gearing up to storm the shores of countries around the world with new multinational services — all thanks to IBM.

AT&T last week announced its plan to buy IBM Global Network for \$5 billion, but the telecommunications giant is getting more than just IBM's multiservice backbone network.

The telco is also gaining 1,300 Internet access sites worldwide, more than 45,000 business customers, 5,000 IBM employees and a data network that spans 850 cities in 59 countries. The buy immediately gives the carrier overseas credibility, something AT&T sorely lacks.

The acquisition is expected to bring AT&T \$2.5 billion in revenue during its first year of operation, says C. Michael Armstrong, AT&T's CEO. AT&T will be able to generate the new revenue by offering worldwide data services from the day the deal closes in mid-1999.

While the company did not discuss specifics about new services to be offered, it's expected that business IP offerings will be the cornerstone of new developments. AT&T users have been looking for such offerings.

IBM's network will give AT&T greater international reach, but AT&T customers won't actually have fully integrated access to IBM's network until late 1999.

Initially, AT&T will set up network-to-network interfaces (NNI) among its frame relay and ATM networks and IBM's frame relay and ATM networks, says Rick Roscitt, president of AT&T Solutions. After AT&T has had a chance to digest the acquisition, the company will come up with a plan to physically link the networks beyond simple NNIs, he says.

But AT&T's frame relay integration may be tougher than Roscitt says. AT&T's frame relay network is based on Cisco StrataCom IGX switches, and IBM's network uses Ascend 9000 frame relay switches. Although not impossible to

integrate, it is difficult to maintain the same features or service levels when combining two dissimilar networks. AT&T will have an easier time when it comes to linking the two ATM networks because both companies use Ascend 500 ATM switches.

IBM's IP network will also be integrated with AT&T WorldNet, which only touts 475 points of presence. Today, IBM Global

AT&T's portfolio prior to this deal. The company's pending merger with Tele-Communications, Inc. will give AT&T access to one of the largest cable television operators in the world.

And AT&T's pending joint venture with British Telecommunications will eventually create a 100-city international network, again addressing AT&T's need to increase its

Synopsis of the deal

**AT&T gets:**

- ▶ IBM Global Network business, which includes its global network, and all of its business and consumer customers
- ▶ 5,000 IBM employees

**IBM gets:**

- ▶ Network outsourcing services from AT&T; AT&T will outsource its legacy application processing and data center management to IBM
- ▶ About 2,000 AT&T employees

Network has at least three OC-3, 155M bit/sec dedicated private peering connections between its IP backbone and AT&T WorldNet's backbone, says Sid Overbey, vice president of IBM's Internet services.

Aristocrat is currently using AT&T WorldNet's Managed Internet Access service to connect its dedicated IP virtual private network (VPN), but Aristocrat was disappointed in AT&T WorldNet's dial-up support in Europe, South America and Australia, says Simon Eggington, IT manager at the Australian casino-software gaming company.

When Aristocrat staffers were unable to connect to the company's VPN while traveling, Eggington switched to IBM Global Network's dial-up service. Once the merger is approved, Eggington hopes the joint company will offer better service rates and incorporated billing, he says.

AT&T continues to fill gaping holes in its business by acquiring companies and striking strategic partnerships. Earlier this year, AT&T acquired Teleport Communications Group, a competitive local access provider that gave the company local network assets, which were absent from

international activities.

The two companies have also struck outsourcing deals in which IBM will manage AT&T's legacy application processing, such as billing, procurement, installation and maintenance, for AT&T's long-distance business customers. This 10-year deal is valued at nearly \$4 billion. IBM is also outsourcing its global network service needs to AT&T for five years, a contract worth about \$5 billion.

Observers praised IBM CEO Lou Gerstner for the Global Network sale. IBM no longer wanted to focus on maintaining a data network that stretched far beyond the company's area of expertise. And now, not only has IBM been able to offload its unwanted asset, it has guaranteed business with AT&T for at least 10 years. ■

CORRECTION

A brief in the Dec. 7 Internetworking section gave the wrong phone number for the NetReference consultancy. The correct number is (703) 742-5400.



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Open source e-mail goes commercial

Firm releases Sendmail Pro, but will users pay for e-mail routing product they're used to getting for free?

By Paul McNamara
Emeryville, Calif.

Move over Linux and Mozilla: There's a new entrant in the growing field of software developers looking to ride open source code to marketplace success.

Sendmail, Inc. last week began shipping Sendmail Pro, its first commercial product. Sendmail Pro is based on the free open source sendmail, which is a server-based message transfer agent. Sendmail has long played a key role in routing e-mail between the Internet and commercial e-mail products.

Given the ubiquity of open source sendmail in corporations and ISPs, it could be argued that Sendmail company founder Eric Allman's commercial debut is perfectly poised to bolt from the starting

gate (see graphic).

Beta testers and industry experts are generally enthusiastic about the release, although some have questioned how anxious customers will be to pay cash for a product they're used to getting for free.

Company executives say Sendmail Pro offers more than enough new features to justify the cost. Included will be a graphical user interface (GUI) designed to ease deployment, administration and management, as well as reporting tools, spam controls, full documentation and previously unavailable service and support contracts.

Sendmail Pro will run on Sun Solaris, Red Hat Linux and Free BSD, with the company planning to add additional Unix support in the future. A Sendmail for Windows NT will

also be offered because the company recently acquired that product's maker, MetaInfo.

The commercialized packages will be attractive to many

The sendmail file

- In 1981, Eric Allman developed sendmail, which first routed e-mail between networks ARPANet and BerkNet.
- Open source versions are used on 78% of Internet mail servers, according to an Illinois University study.
- The company claims 84 of the 100 largest U.S. companies are using open source sendmail.
- The latest version of open source sendmail, 8.9, is downloaded 2,800 times per week.

organizations that have come to depend on sendmail for handling their Internet e-mail, according to Randall Winchester, coordinator of Unix support at the University of Maryland in College Park.

"For the administrator, the GUI part is a real plus that is just going to wow a lot of people," says Winchester, who runs open source sendmail on 45 e-mail servers and 1,000 Unix-based clients. "The end users get the same solid Simple Mail Transfer Protocol service they've been getting all along with the open source."

There could be a tangential benefit from the GUI for e-mail network managers, he adds.

"I could probably start delegating some of this administration out to somebody else now who doesn't have to be a send-

mail wizard," Winchester says. "That's exciting."

Sendmail Pro costs \$1,298 for a single-processor, unlimited user license. Sendmail for NT costs \$498 for a 10-user license.

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Net management wises up

By Jeff Caruso

Network managers are about to get a couple of smarter management tools.

Computer Associates last week began shipping software agents, dubbed Neugents, that can learn. Separately, Concord this week will unveil products that more intelligently extract data from Cisco devices.

Promised last April, CA's Neugents reside on servers or workstations and help make up a neural network, the company says. Neural networks are designed to work like biological neurons to learn and recognize patterns.

Over a period of a few weeks, Neugents learn the normal network or server behavior. Using the learned behavior as a guideline, an agent can make predictions about when systems might fail. The Neugent product now shipping focuses on performance, so it looks at response times, transaction volumes and other telltale performance signs. From these indications, a Neugent predicts when systems will experience performance problems, and it generates an alert.

"The more data you feed a Neugent, the smarter it gets,"

says Tony Navarro, manager of systems management at Allegiance Healthcare in McGaw Park, Ill. "It gives us an opportunity to be proactive in our management instead of reactive."

"The predictions that were made were 100% reliable, and we never had to deal with false predictions," says Sorrel Jakins, director of server systems at Brigham Young University in

form, Unicenter TNG. Neugents are also one of three major ingredients of the next version of TNG, Unicenter The Next Dimension (TND). The new version of TNG also provides a way to view the status of the network and systems at different points, and includes an improved user interface. TND is scheduled to ship next year.

Neugents are available for Windows NT servers, with prices starting at \$2,000.



Networks based on Cisco gear should become easier to manage with new Concord software.

Concord and Cisco


Concord Communications in Marlborough, Mass., and Cisco are working together to improve Concord software's ability to access data held by Cisco's management software and Internetwork Operating System (IOS) for routers and switches.

In the second quarter of 1999, Cisco will release a beefed up version of its Response Time Reporter agent for IOS. The new version will be able to measure response time for HTTP traffic, as well as jitter and packet loss. The software already measures responses for TCP, User Datagram Protocol (UDP) and Internet Control

Provo, Utah, which has been beta-testing the agents.

Future Neugents will help in areas such as asset management, security administration, storage utilization and capacity planning.

Neugents are used in conjunction with CA's network and systems management plat-



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your toughest problems. For more answers, **Better answers.** better answers, visit www.compaq.com/me.

3Com, Siemens join in venture

By Jim Duffy

3Com and Siemens last week announced plans to form a joint venture the companies say will better enable them to serve customers looking to run voice, video and data over their LANs.

The companies have invested a total of \$100 million in the LAN telephony venture, which is an outgrowth of a product development alliance the companies have had in place for the past 18 months.

Products developed by the new organization, which opens for business early next year, will include communications servers, digital phones, LAN telephony gateways and call processing software for small, mid-size and large enterprises. LAN

telephony gateways let users make voice calls from LAN-connected PCs and telephones across public switched telephone networks.

The products will combine 3Com's SuperStack II and CoreBuilder LAN switches with Siemens' Hicom and HiNet PBX and call processing technologies. The products will be sold by Siemens, 3Com and their respective distributors.

In the first quarter of next year, 3Com plans to deliver digital phones and adapters that can be used in a LAN telephony environment. In addition, 3Com will release the SuperStack II PBX 1000, a switch based on Siemens' Hicom 150E technology, that integrates LAN and PBX

functionality. 3Com in the first quarter will also roll out the SuperStack II LAN Telephony Gateway, a private-label version of Siemens' HiNet LAN Telephony Gateway. 3Com will then start reselling Siemens' Windows NT-based HiNet RC3000 call processing software.

In the second half of 1999, the joint venture will deliver stackable multimedia exchanges: Ethernet LAN switches with integrated call processing for real-time voice/video communications. Also scheduled to debut are Ethernet phones for sites with up to 500 users.

The joint venture will also build multimedia exchanges for large sites based on 3Com's CoreBuilder 9000 switch. ■

Benhamou weighs in



3Com Chairman and CEO Eric Benhamou last week spoke with *Network World* Senior Editor Jim Duffy about the Siemens deal and other topics.

On expanding beyond a development alliance with Siemens:

The joint venture sends a much clearer message to the market and to our joint customers. We also found a reasonable way to address the issues — they're always sensitive — of shared intellectual property. Implementing LAN telephony requires intimate sharing of data switching intellectual property and voice communications.

On the likelihood of Siemens taking an equity stake in 3Com:

It's nil. It makes no sense. Siemens doesn't have that much cash to begin with.

On which markets hold the greatest growth potential for 3Com:

The one that we're most excited about in the near term is the small/medium enterprise segment. The large enterprise segment is much more mature but is still growing. And our opportunity to grow in that segment is greater today than ever. We're just starting a strong product cycle [including new CoreBuilder switches]. The small/medium enterprise market, on the other hand, is very

early in its stage of life. The Internet and the Web are making it possible for small businesses to look like large businesses and to not be at a disadvantage when it comes to electronic commerce. So they have many reasons to want to network at an accelerated rate.

Networks for consumers are very exciting because eventually they will be the biggest market.

On the state of the enterprise network market:

It will accelerate again as a result of convergence becoming real for these customers. What's going to happen in the next few years is basically the PBX market for the large enterprise is going to be swallowed up. This alone will give a kick to the growth rate of the large enterprise market. Our joint venture with Siemens is going to address that. Siemens is very strong in small/medium enterprises but even stronger in the high-end of the PBX market. Today, I gave you a growth rate in the low-teens; I do think it could pass 20% in a couple years.

On wireless networking:

If you talk about wireless LANs, I do think it's now a good segment to invest in. Up until

now, multiple times we've come this close to introducing a line of wireless LAN products, and we'd say, "Why do you want to vie for a \$100 million market segment?" But things are changing. There is much more certainty around the IEEE 802.11 standards. So we see wireless as a much more natural technology for the large enterprise.

Another kind of wireless technology that is very important is fixed wireless for long haul services. There have been such advances in technology there. I



remember when we couldn't figure out a way to get around the rainy day phenomenon. You had line-of-sight products and, on a day like this, forget it. Today, you can get around that.

We will be fully engaged with a line of wireless LAN and WAN products. ■

3Com

Continued from page 1

centers. The new version is for use in wiring closets connecting up to about 200 nodes, according to 3Com officials at the company's Networks3 user conference here last week.

Currently, 3Com's wiring closet products consist mainly of stackable SuperStack II switches. But the company says its new chassis-based switch provides more ports and more high-speed workgroup-to-backbone connectivity options.

"It's pretty nice for a high-density wiring closet," says Kurtis Lindemann, network specialist at the College of Business at Ohio State University in

Columbus, which is among the select 3Com accounts already using the new switch. The school has packed its seven-slot switches with 36-port 10/100M bit/sec modules and Gigabit Ethernet uplinks.

Lindemann says that with the smaller CoreBuilder 9000 box, users won't have to pay for a redundant switching fabric, as they would with the 16-slot version. However, seven-slot chassis customers will still get redundant power supplies and management modules. The downside is if users want to expand to two switching fabrics, they can't, he says.

"It isn't really designed for core, ultraredundant applications," says Duncan Potter, 3Com director of product management for switching systems.

For packet networks, the seven-slot CoreBuilder 9000 features a 120G bit/sec backplane. Six of its slots can be used for switching modules — the same Ethernet, Fast Ethernet, Gigabit Ethernet and ATM modules used by the 16-slot CoreBuilder 9000 — and the seventh slot houses the switch fabric. Two slots can be used for management and controller redundancy.

The seven-slot chassis will support ATM core switching configurations in the first quarter of 1999, Potter says. As an ATM switch, it will support dual-homing for redundant connectivity between workgroups and backbones, 3Com

says.

For Layer 2 applications, the seven-slot CoreBuilder 9000 will go up against Cisco's new Catalyst 4000 and a stack of Nortel Networks' BayStack 450s. For Layer 3 requirements, the 3Com switch will vie against Cisco's Catalyst 5500 and 8510, Cabletron's SmartSwitch Router 2000 and Nortel's Accelar 1050. Nortel is also expected to unveil new

chassis-based wiring closet switches early next year.

Modules for the seven-slot CoreBuilder 9000 include two- and nine-port Layer 2 Gigabit Ethernet, 20-port Layer 2 10/100Base-TX autosensing, and new 36-port Layer 2 10/100Base-TX and 10-port Layer 2 100Base-FX



3Com will announce a scaled-down version of its CoreBuilder 9000.

cards. The Gigabit Ethernet modules are optimized for backbone and server aggregation, while the Fast Ethernet cards are designed for high-performance desktops and workgroups, server connectivity and downlinks to backbone switches.

The 36-port module will ship in volume next month, while the 10-port module will ship in February.

In late February, 3Com will release Layer 3 Fast Ethernet modules for the seven- and 16-slot CoreBuilder 9000s. One will be a 12-port 10/100Base-TX card and the other will be a 10-port 100Base-FX module.

3Com will also roll out high-density Layer 3 Gigabit Ethernet modules for the CoreBuilder 9000 line in the second half of 1999, 3Com officials say.

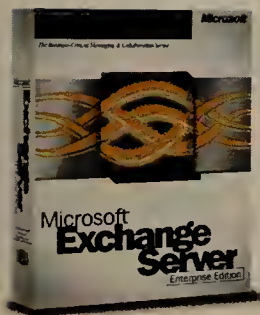
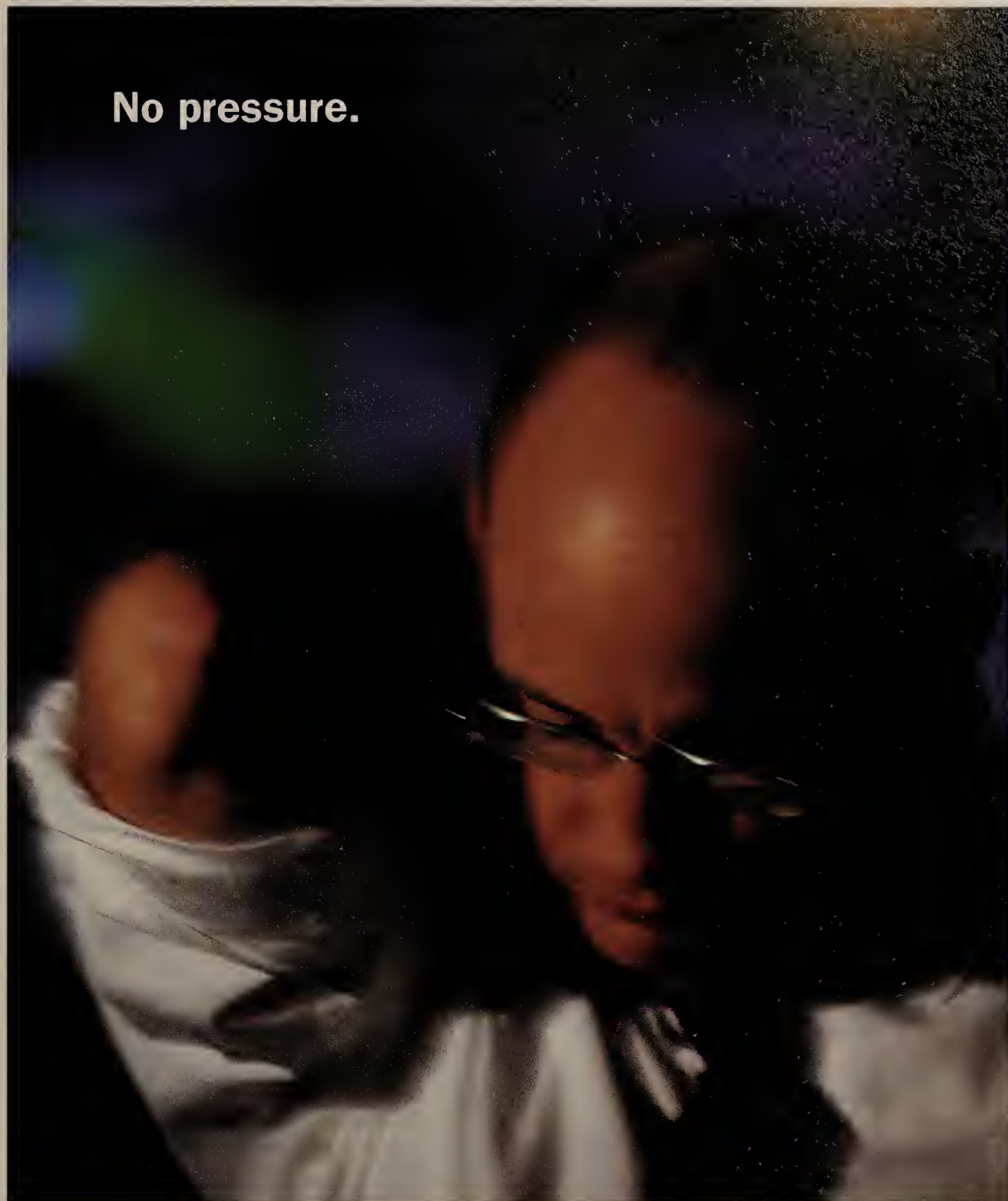
Six-port FDDI cards for the CoreBuilder 9000 line will be delivered in the second half of 1999. In addition, the company is developing modules with single-mode fiber and SONET-based interfaces, Potter says.

Pricing for the seven-slot CoreBuilder 9000 will be comparable to the 16-slot version and other vendors' offerings: about \$250 to \$300 per Fast Ethernet port and \$2,500 for Gigabit Ethernet.

3Com can be reached at (408) 326-5000.

Senior Editor Jeff Caruso contributed to this story.

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THE MICROSOFT DIARIES

Week Eight

The Microsoft-DOJ Trial

MONDAY, DEC. 7

A lot happened in the Microsoft-Department of Justice case today; it's just that not much of the action was in the courtroom.

First, North Carolina took its name off the plaintiff's list. The state's top cop said the AOL/Netscape/Sun deal was proof enough for him that competition in the software industry is alive and well. Hmmm . . . that's the point Microsoft's been making.

Then Microsoft held its own press party to whine about just how far the government's case is off the mark. Bill was there via a live satellite feed. He complained about and explained his 20-hour videotaped deposition. Gates said he was being as little help as possible to Justice Department lead attorney David Boies because the lawyer made it clear before taping began that he was out to destroy Microsoft.

TUESDAY, DEC. 8

We got a break from Sun's top Java guy James Gosling, who had been testifying. The government took University of Pennsylvania professor David Farber out of turn and put him on the expert witness stand. In his written testimony, Farber argued the finer points of browser/operating system integration.

On the stand, he maintained there are no technical barriers keeping Microsoft from splitting up its browser and operating system. Farber said Windows with Explorer is like a bag of groceries. Customers want to pick and choose items, but "they are stuck with the whole bag."

WEDNESDAY, DEC. 9

The government zinged Microsoft with its own words today. Government attorneys asked witness Farber to read aloud the meaning of the phrase "Internet Explorer" from Microsoft's

1997 Computer Dictionary. Internet Explorer is a Web browser, which is an application, the dictionary explains. And, therefore, contrary to Microsoft's legal claims, it is not an integral part of the operating system. With that argument presented, the government let its expert witness step down.

Microsoft seemed to make up for the semantic bobble when it introduced evidence that shows that competitors are always ganging up against it. When Sun's Gosling got back on the hot seat, Microsoft lawyers asked him why Sun rejected Microsoft's numerous offers to develop common interfaces for Java. Why did Sun rebuff Microsoft but solicit 11 other technology companies to work jointly on those same interfaces?

Gosling said that Microsoft was not interested in doing anything in terms of cross-platform design for Java.

THURSDAY, DEC. 10

Gosling today continued in his claim that Microsoft violated the Java "community" effort.

But Microsoft corporate gun Tom Burt pushed Gosling to talk about how Sun has refused to play nice with Microsoft. One missed opportunity for cooperation, Burt said, occurred in April 1996. In an e-mail written after a Sun-Microsoft meeting, a Sun executive expressed worry over Microsoft's use of the term "language extensions" in regard to Java.

Burt asked Gosling if anyone from Sun talked to Microsoft about its use of the language extensions term. Gosling said no one did, adding that Sun didn't think "that this was going to lead to something that would require us to send a nasty-gram from a lawyer."

— Christine Burns



Farber: Explorer users can't shop around.

Vendors air VPN traffic guidelines at IETF meeting

Proposals offer better handling of VPN traffic; working group may be formed.

By Denise Pappalardo
Orlando

The Internet Engineering Task Force (IETF) is trying to make virtual private networks (VPN) easier to administer.

Lucent, Ascend and Cisco were among a handful of vendors that last week presented to the IETF new draft specifications designed to make VPN traffic that traverses multiple ISP networks more readily identifiable and easier to manage.

Because users want a cost-effective alternative to link their corporate networks, VPNs continue to grow in popularity.

Not only can users save money by switching from private-line connections to an Internet-based VPN, they also can open the door to simpler voice, video and data network integration.

Easier management

One of the drafts proposed uses "VPN Identifiers," which are unique data bits that would be added to the header of a VPN IP packet.

These VPN Identifiers would let an ISP more easily classify particular VPN traffic as a whole entity as it traverses the Internet, says Barbara Fox, an engineer at Lucent. This would make VPN data easier to manage and prioritize.

Another IETF draft specification, called virtual routing, would make use of the VPN Identifier proposal.

Virtual routing is designed to eliminate today's need for every VPN to have a designated route over an ISP's network, explains Andrew Malis, consulting engineer at Ascend.

The virtual routing draft specification calls for an additional layer between Layer 3 and Layer 4 in the Open Systems Interconnection stack. This new layer would support virtual routes that could be set up as needed,

says Karthik Muthukrishnan, product development manager at Ascend. The additional layer would let an ISP set up a VPN based on VPN Identifiers.

But debate among IP experts persists about the best way to forward packets based on virtual routing.



IETF's Baker: Not certain about the need to standardize VPNs.

between multiple routers throughout a network.

Lucent's Fox says that technically either protocol works, but Ascend portends that because MPLS does not require routing protocol translation, it's the better method. Eric Rosen, an engineer from Cisco who is on the side of BGP, says most routers in the Internet already support BGP, making it easier for ISPs to offer users virtual router-based VPN services.

Issues to be resolved

This debate, in addition to other VPN issues, is far from settled. The IETF is in the process of deciding if a VPN working group will be formed to hash out some these draft specifications or if existing working groups should handle the task. A charter, or set of goals, for a VPN Working Group needs to be more concise before a group will be formed.

IETF chair Fred Baker isn't sold on the idea of a VPN working group just yet. "I'm not sure VPNs need to be standardized," Baker says. Standards need to be developed to address interoperability issues, but not to define different VPNs, he says.

Senior Online Reporter Sandra Gittlen contributed to this story.

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This week's question:

AT&T this year announced close to \$50 billion worth of acquisitions. What cellular company did AT&T say it would buy back in October?

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Sun scores with open Java

By Chris Nerney
New York

Most Java users and developers think Java development will accelerate now that Sun has eliminated the upfront licensing fee that nearly 200 vendors have paid over the past three years.

"A lot of innovation will result from this," says Scott Dietzen, a vice president for Java developer BEA WebXpress.

Other developers agree. "Once technology is free, it's wide open and everyone can develop with it," says Kikuo Muraoka, director of Java development at Fujitsu Software in San Jose.

Sun announced at Java Business Expo last week that it would no longer charge a one-time fee for use of the Java source code, though Sun will continue to collect royalties from companies

once they release commercial software.

The announcement, made on the eve of the second annual Java show, overshadowed Sun's long-awaited unveiling of Java 2, known until last week as Java Development Kit (JDK) 1.2. Many key components of JDK 1.2, such as its Swing development tool sets and upgraded security features, have actually been released in the past several months.

Sun made two other not-so-unexpected announcements related to its involvement in the America Online/Netscape deal made public late last month:

- The firm's HotJava browser will be combined with Netscape's Navigator to form a single browser, which will help Sun ensure the availability of a popular Java-compatible browser. The browser will work on desktops and embedded

consumer devices.

- Sun will combine its NetDynamics application server with the competing Kiva software sold by Netscape.

Many licensees have long complained about Sun's control of the Java language, which company engineers developed in the early '90s.

Previously, for an upfront fee ranging from five figures for small independent software vendors to seven figures for large companies such as IBM, licensees would have access to Java source code and support.

These fees have been keeping Java out of the hands of

cash-poor commercial developers. Further, Java contracts required anyone adding to the source code to cede intellectual property rights to Sun.

Provisions have changed under Sun's new "Community Source License" agreement:

- Commercial developers

the source code without having to give the innovation to Sun.

- Commercial developers can modify and share compatible source code with other commercial entities without paying a fee.

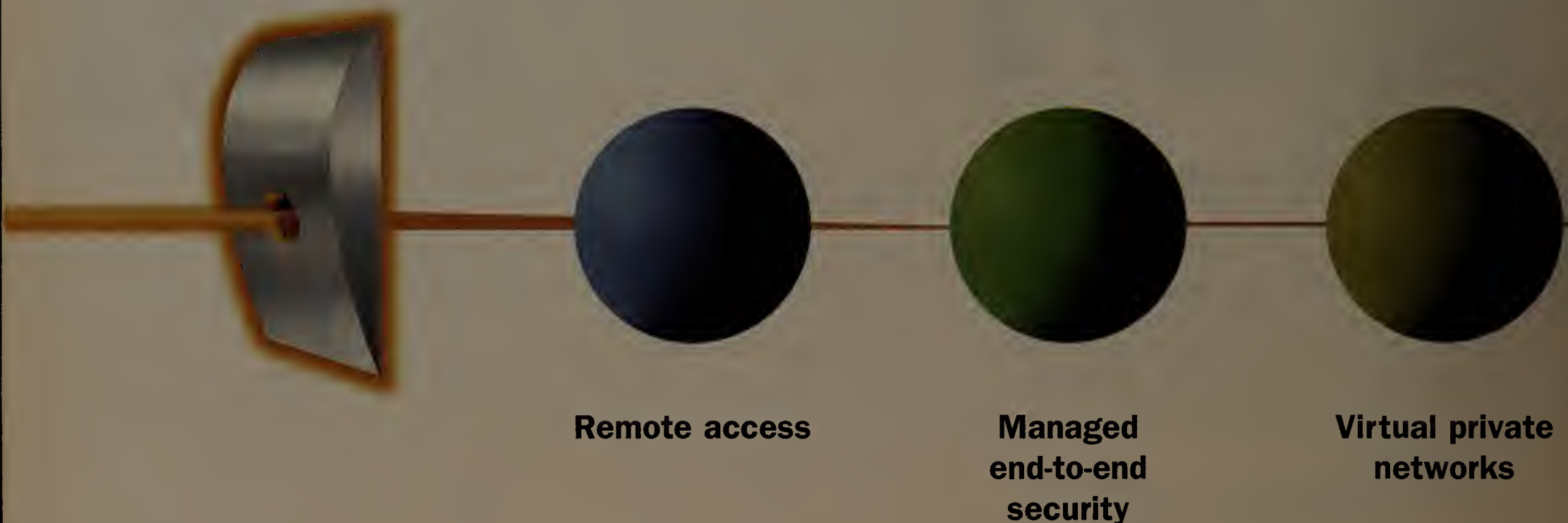
Some licensees who paid fees in recent months have been asking about rebates, but none will be given, says Alan Baratz, president of Sun's software division.

"If Microsoft releases Windows 98 and someone just bought Windows 95, would Microsoft give them a rebate? Of course not," he says.

One developer looks forward to improvements made by small companies and other organizations. The new licensing "will get university students and more small companies involved in developing Java," says Dave Hawkins, president of Facet Decision Systems, which makes software for building advanced computer models without programming. ■

"Once technology is free, it's wide open and everyone can develop with it."

Kikuo Muraoka, director of Java development, Fujitsu Software



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Proposal

Continued from page 1

amount of control over the lines and hardware necessary to provide DSL services.

Under the proposal, RBOCs would not have to offer cut rates to bulk resellers of DSL services, thereby eliminating a whole class of alternative providers, critics say.

With the agreement, RBOCs would also gain the right to sell data services beyond local calling boundaries if that sale would significantly cut the cost of providing those data services.

And RBOCs would be able to sell data services through separate subsidiaries. Competitors worry the subsidiaries could get preferential treatment from the parent RBOC in the way of faster line provisioning and customer access.

Competitive local exchange carriers (CLEC) are also unhappy with the proposal because its provisions could

block the easy access to secure facilities within carrier switching offices that CLECs say they need to provision DSL.

"Without the right protections, this is not a good idea, it is a wolf in sheep's clothing," says Michael Malaga, president of CLEC NorthPoint Communications, a DSL vendor.

The group generated the proposal in response to an FCC request made last summer for

suggestions on whether it should let RBOCs sell long-distance data services. The proposal outlines 10 principles intended to give RBOCs more incentive to rollout DSL and other data services, according to Peter Pitch, a former FCC staffer who now directs Intel's telecommunications policy.

"We want competition to drive down prices, but we realize the RBOCs will be incredibly

important to deployment," Pitch says.

CLECs want guarantees that RBOC subsidiaries that sell DSL services have to go through the same ordering process as CLECs, according to Chuck Haas, vice president of marketing for Covad Communications, another CLEC that specializes in DSL.

The FCC is scheduled to decide on the proposal next month. In a separate but related matter, the FCC issued a report last week stating that local phone competition has increased little since the Telecommunications Act of 1996 became law nearly three years ago (see graphic). The act mandates that the FCC draw up rules to encourage competition.

Fresh off its success in speeding the approval of a DSL standard (NW, Oct. 19, p. 8), the computer industry stalwarts may be out of their league here.

The network companies in

the consortium were able to place their employees on the standards committee, but they cannot put their employees on the FCC.

For its part, the FCC has been gathering data since October on whether it should loosen restrictions on RBOCs, according to John Reister, director of product marketing for DSL hardware vendor Copper Mountain. Reister participated in roundtables on the issue that were run by the FCC, and the consortium is coming late to the table.

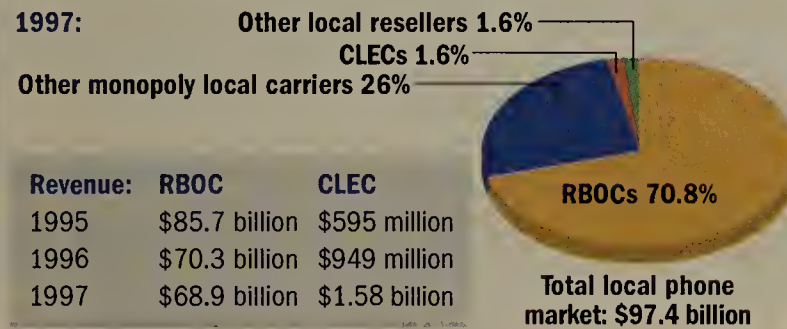
"This appears to be a public relations effort by the Bell companies to influence the FCC with consumer pressure at the eleventh hour," Reister says.

Ameritech was the only RBOC that failed to sign the proposal. It had already worked out a separate joint proposal with DSL service provider NorthPoint. ■

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RBOCs STILL RULE

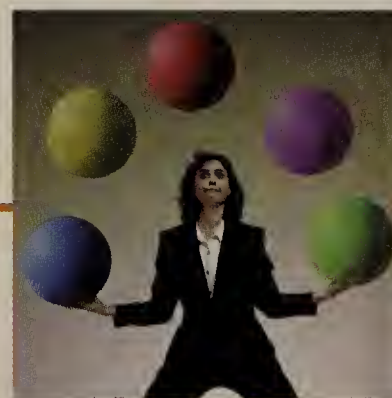
Three years after the Telecommunications Act of 1996 regional Bell operating companies still dominate local phone markets, but competitive local exchange carriers are slowly making inroads.



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Novell broadens appeal of NDS, NetWare

By Christine Burns

Novell did two things last week: It introduced NetWare 4.2 and announced a directory deal with Tivoli Systems.

NetWare 4.2 is aimed at users leery of

leaping all the way to NetWare 5.0 but who still need Year 2000 patches and 4.X bug fixes.

Meanwhile the Tivoli deal, first reported in *Network World* in October,

pushes Novell's directory into the enterprise systems management realm. Novell has been working with Tivoli for six months, trying to tie the Novell directory to select Tivoli enterprise network man-

agement tools. The companies expect to have Tivoli Inventory, Software Distribution and User Administration software linked to Novell Directory Services by early next year.

The ties will let customers use the Novell directory as the central data store for network and user information collected by the Tivoli tools. Martin Neath, Tivoli's executive vice president, says Novell directory customers will reduce their network management costs by not having to maintain redundant databases for user information.

The two companies — which claim they have a significant overlap of Fortune 1000 accounts — are also working on software that links Novell's ManageWise server and desktop management package to Tivoli's Enterprise platform, formerly called TME 10. The new ManageWise Provider for Tivoli Enterprise will allow the two systems to share network alarms, network topology and inventory data. Additionally, Tivoli is building a management agent for NetWare 4.X

servers. Currently, Tivoli's system can only manage NetWare 3.X servers. These two products will also ship sometime in the first quarter of 1999.

While the Novell directory folks were out courting Tivoli, the platform team was prepping a new version of the network operating system. NetWare 4.2, due to ship later this month, includes all of the Year 2000 software patches and bug fixes released since NetWare 4.11 was shipped 18 months ago. NetWare 4.2 also includes IP-based client software that will let users tap into any NetWare 5.0 servers sitting on the same network.

Additionally, the bundle includes a five-user starter pack of Novell's desktop administration tool, ZENworks; a five-user version of Oracle's database that runs on NetWare; and Netscape's Fast-Track Server, which replaces Novell's own Web Server.

Novell built the final version of the NetWare 4.X line to help customers who don't want to swap out their tried-and-true 4.X servers for the new NetWare 5.0 bundle.

"A lot of folks aren't ready to make the jump to an all-IP system like NetWare 5.0," says Joe Douppnik, a professor in the computer engineering department at Utah State University in Logan. He has been beta-testing NetWare 4.2 alongside the department's NetWare 4.11 and 5.0 server. "This version gives them all the updates they need and fits right in at their comfort level," Douppnik says.

NetWare 4.2 will replace NetWare 4.11 and IntranetWare. Pricing starts at \$1,095 and includes a five-user license.

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NetWare 4.X users don't have to upgrade to Version 5 just yet.

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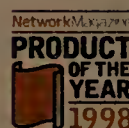


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Briefs

■ **3Com** has announced the acquisition of Boulder, Colo.-based **EuPhonics, Inc.**, a developer of **audio software**, for \$8.3 million. With this deal, 3Com will integrate sound technology with desktop and mobile PC modems and network interface cards. 3Com says these devices will be more capable of supporting applications such as IP telephony, LAN telephony and streaming multimedia. The products will be released in the second quarter of 1999, 3Com says.

■ **Olicom A/S**, best known as a supplier of token-ring gear, has outlined a plan to spur future revenue growth by jumping into the **Fast Ethernet switch** market next year. The company's plan includes a corporate restructuring that involves the layoff of 20% of the company's work force and an \$8 million charge against fourth-quarter earnings to cover restructuring costs. Olicom, which lately has struggled financially, plans to support its token-ring customers for the foreseeable future, but also will help customers migrate from token ring to Fast Ethernet as its new products emerge.

■ **Sequent Computer Systems** last week unveiled a hardware and software package designed to simplify the management of **Unix and Windows NT servers**. NUMACenter 2.0 consists of a chassis for housing the servers and software for managing them. The Advanced Detection Availability Manager software component enables companies to monitor server performance, consolidate print queues and provide single logon capabilities to end users. NUMACenter 2.0 prices start at \$250,000 for an eight-processor Pentium II Xeon-based system. ☎ Sequent: (509) 578-4757

Compaq rolls out net storage road map

By Deni Connor
Houston

Compaq's press release on storage was five pages long, followed by four pages of customer and analyst references, a 28-page presentation and a 14-page white paper. But in all that space, the server giant was unable to define what storage products and precise technologies would be forthcoming.

The company's Enterprise Network Storage Architecture, unveiled last week, is a roadmap for storage management, migration to storage-area networks and storage allocation. The core goal of the Compaq architecture is to make storage as readily available as electricity.

Currently, network storage is heavily tied to individual servers with each server owning the storage attached to it. The Compaq architecture will allow storage to be taken from distributed pools, to be drawn on when a server needs more disk or tape space. Storage can

even be returned to the pool if it is overallocated. Thus, the Compaq approach distributes storage across the enterprise to

Tessco Technologies, a wireless products supplier in Hunt Valley, Md.

Kuff, who uses Digital Storage-

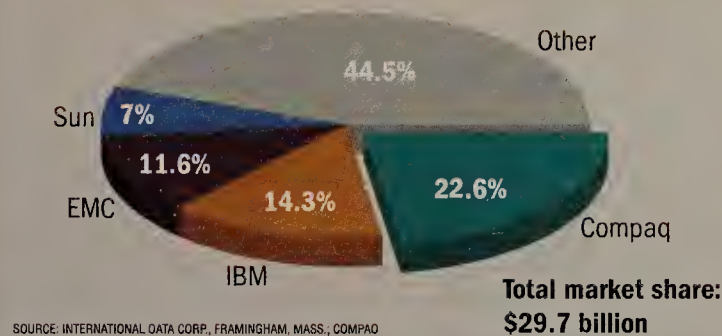
ized pool of storage."

Several vendors, including Computer Associates, Legato, Veritas and Seagate, have en-

STORAGE STRATEGY

Compaq, already a storage market leader, last week laid out plans to strengthen its market position.

1998 worldwide disk storage system revenue market share:



where it can be used best.

This vision of storage pools "has been on everyone's really cool, theoretical list for a long time," says Hall Kuff, manager of systems and networking for

Works on OpenVMS, says, "The average IT site over-subscribes on storage for each system to provide a buffer. This vision takes it one step further, allowing you to have a single, central-

Compaq's storage roadmap

March 1999:

Will deliver technology for building Fibre Channel-based enterprise storage networks.

May 1999:

Will offer the Fast Ethernet component of its new Enterprise Network Storage Architecture.

November 1999:

Will roll out Fibre Channel-based storage-area network technology.

Cisco offers stackable alternatives

Yet analysts predict company may offer stackable switches in the future.

By Jim Duffy
San Jose

Cisco's new fixed-configuration and modular LAN switches are designed to offer users a cost-competitive alternative to stackable wiring closet switches.

The switches — the fixed-configuration Catalyst 2948G and the three-slot Catalyst 4003

— are designed for use in wiring closets to support workgroup, backbone uplink and server farm applications.

The 2948G sports 48 10/100M bit/sec Ethernet ports and two Gigabit Ethernet uplinks. The Catalyst 4003 offers up to 96 10/100 ports and 36 Gigabit Ethernet ports via 48- and 18-port modules, respectively.

Cisco's new offerings provide about the same number of switch ports that customers can get by assembling a tower of stackable switches, which are popular among companies that need a flexible switching growth path.

While Cisco currently does not offer stackable 10/100 switches, analysts expect the company to do so in the near future.

Cisco customers are probably comfortable with Cisco's current modular switches,

given their significant port density, says Esmeralda Silva, an analyst at International Data Corp., a Framingham, Mass., market research firm. But she says many companies prefer stackables for use in wiring closets.

"Cisco's never been one to ignore market trends, and if stackables start to become the dominant workgroup platform, it'll do whatever it needs to do to get its box out there," Silva says.

Les Poltrack, a Cisco product marketing manager, says the company is not ruling out the addition of 10/100 stackables to its product portfolio.

Cisco's 2948G costs \$8,995 and will be available in the first quarter of 1999. The Catalyst 4003 costs \$187 per 10/100 port and \$1,277 per Gigabit Ethernet port. It will also be available in the first quarter.

☎ Cisco: (408) 526-4000

dorsed Compaq's architecture.

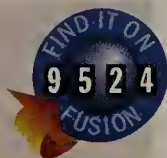
EMC, an enterprise storage vendor representing more than 10% of the open storage market, has a similar concept called universal data tone. The EMC approach relies on a centralized pool of storage rather than distributed groups, allowing greater manageability.

In addition to distributed storage pooling, Compaq's architecture will include the capability to replicate data across remote locations to increase availability and fault tolerance, and make time available to back up the network. Data on a net in Houston, for instance, may be replicated to a network in Boston. Users at both locations will have access to the data while it is being backed up.

The firm will also combine its storage management products — Compaq StorageWorks Enterprise Backup Solution, Compaq Insight Manager and the Array Controller Utility — into a single package over the next five years. Still unnamed, the software package will take on a Web-based Enterprise Management (WBEM) interface by early 2000, which will let management occur from a Web browser. Replication of data between nets will take place before WBEM-enabled storage management is available. ■

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Cisco's Catalyst 4003

www.cisco.com



Microsoft's bad year

The year 1998 is fast closing (and the year 2000 is fast approaching). This year is one Microsoft probably wants to forget. No one was a bigger loser in '98 than Microsoft. The only close competitor was America Online, with its \$4.2 billion offer to essentially buy Netscape's portal site. (Hey, Steve Case! I can sell you a whole bridge for a lot less.)

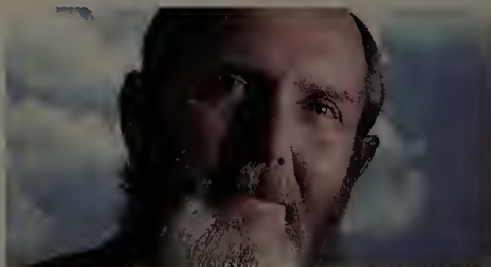
Last month, Windows NT took a beating both as an application platform and a network server in analyses released by D. H. Brown Associates and the Giga Information Group.

D. H. Brown, in its annual review of application server platforms, ranked NT behind IBM's AIX (which came in first), Compaq's Digital Unix, Sun's Solaris, Silicon Graphics' Irix and

Hewlett-Packard's HP-UX. NT finished last in each category of the study except support for PC clients (where it was second to Digital Unix). Categories included scalability, reliability, availability, serviceability and system management.

On the network server front, Giga Information Systems found that upgrading from NetWare 4 to NT 4 would cost 2 to 3 times as much as upgrading to NetWare 5.

Among the issues raised were performance, reliability and administrative cost. Field interviews showed that in a large enterprise, an all-NT network would need up to twice as many servers as NetWare. And NT's inability to make full use of high-speed bandwidth would mean increasing the number of subnets and back-



Dave Kearns

bones throughout the network.

Giga also found you'll need more administrators, pay higher salaries (because of the lower number of

Giga Information Systems found that upgrading from NetWare 4 to NT 4 would cost 2 to 3 times as much as upgrading to NetWare 5.

Microsoft Certified Software Engineers available) and spend more for training with NT than with NetWare.

Bill Gates and Microsoft have never had a year like 1998.

Setbacks in court in Sun's Java lawsuit coupled with the ridicule Gates has drawn for his taped testimony in the antitrust case battered Microsoft on the legal front. Directory partner Cisco's endorsement (if a tepid one) of Novell Directory Services (NDS) coupled with the ringing endorsement of NDS by Lucent and Nortel Networks hit the Redmondites on another front. Then

two different analyst groups turned thumbs down on Windows NT Server.

First their enemies beat them. Then their friends turned on them. Finally, the neutral observers dissed them. Don't you feel sorry for Bill?

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@uquill.com.

Tip of the week

My friends at Knozall Systems have released a new Novell server-based product called ZipWiz, a NetWare Loadable Module designed specifically to compress and decompress files with long file names to improve the speed of network file distribution. The tool can scan directories and subdirectories; include and exclude files with specific attributes; delete, freshen, move, update and handle long file names; and create a log of actions. Network administrators who need to send applications or upgrade patches or any other files across the network can realize up to a 90% reduction in the time it takes to execute and manage the distribution process. Find out more at www.knozall.com.

Three things to consider before you install your server... Location. Location. Location.



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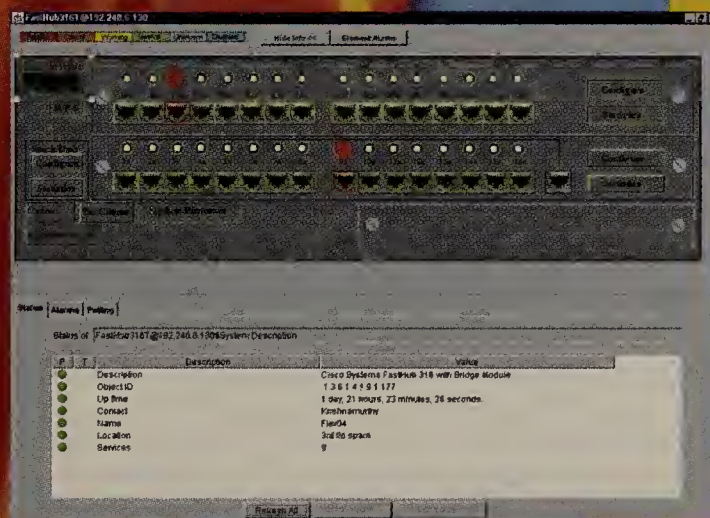
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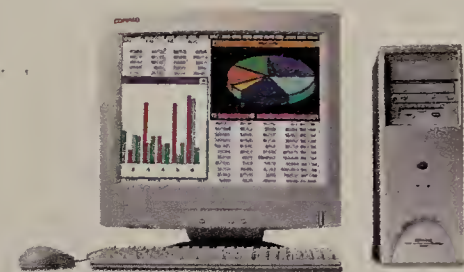
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Linux makes headway

While not all CIOs are sold on Linux, more companies are making a case for its use.

Linux proponents have something to prove to chief information officers: Anything commercial operating systems can do, Linux can do better.

Linux backers say the technology's low cost and flexibility have earned it a bigger role in enterprise networks. But because many IS higher-ups are skeptical about the technology's stability, security and support options, Linux has largely been sneaked in corporate back doors and then relegated to use in low-profile applications and networks.

It appears, though, that this Unix variant may finally be ready to come out into the open at more companies. Linux supporters are now becoming bolder, empowered in part by recent Linux endorsements by companies such as IBM and Oracle, as well as by solid commercial versions of the technology from companies such as Caldera Systems and Red Hat Software.

There are also a growing number of companies that have put Linux to the test and have been satisfied with the results.

Linux on the right track

The Canadian National Railway is one organization that is already using Linux for all sorts of applications.

The railway started using Linux several years ago to give a small group of end users inexpensive, simple access to the Internet. Since then, the railway's Linux installation has ballooned to 80 servers handling more than 4,000 SendMail messages daily and providing 8,000 end users access to the Internet through a series of Web, File Transfer Protocol, news and proxy services.

"We looked at all the PC-based Unix systems out there, and we get the bang for the buck we need from Linux," says Don Lafontaine, senior systems programmer at the railway.

The railway is now in the process of installing a Linux-based Web site through which customers can do everything from book trains to track cargo. The site will also rely on a few Solaris boxes for mainframe connectivity — a job Lafontaine says could be handled just as well by Linux machines. But "that's not my call," he adds abruptly.

Rockefeller University's Sali Lab in New York is another Linux supporter. The lab is using a cluster of Linux PCs and Silicon Graphics, Inc. boxes running SGI's proprietary Unix derivative to produce 3-D renderings of human proteins.

By Christine Burns

Assistant Professor Andrej Sali, who heads up the human genetics lab, says this configuration churns out computation jobs in a matter of days rather than weeks, and minutes instead of days. Sali has secured funding to purchase a new 64-way Intel processor-based server that will run TurboLinux, a commercial version of Linux

NT server than NT Server is," Burnside says. Likewise, he says a Linux machine configured as an AppleTalk workgroup server processes data noticeably faster than a native Apple workgroup server. And the Linux server handles TCP/IP traffic 25% faster than any of the proprietary Unix software Burnside has tested.

It may be the TCP/IP support that is making Linux a favorite among mid-size companies setting up Web sites. More and more

LINUX IN THE GENES

Rockefeller University's Sali Lab is using Linux workstations, and soon will install a Linux server, to process complex computer models.



1. A scientist inputs new data about amino acids into a Pentium II workstation running Pacific HiTech's TurboLinux.



2. The information is processed by a cluster of five workstations, two PCs and a Silicon Graphics server. The lab plans to add a 64-way server running TurboLinux that is expected to halve modeling time.



3. 3-D computer models of human proteins are produced.

packaged by Pacific HiTech with 24-hour service and support. Sali decided to expand the cluster's Intel/Linux component because he could get more computing power for his money.

"A 400-MHz Pentium II computer costs \$1,500 and is as fast for our computations as a \$20,000 Silicon Graphics workstation with a 175-MHz R10000 processor," Sali says.

Flexing Linux muscle

If Linux's price fails to sway large organizations, its flexibility could. Texas Tech University has found the technology holds up well in its heterogeneous network environment, says Lee Burnside, a systems administrator at the Lubbock, Texas, school.

Burnside runs a network anchored by three Linux servers and one NT Server box. The network serves about 130 client machines running a mix of desktop operating systems and handling applications ranging from word processing to serious scientific number crunching.

"We use Samba Unix software for NT file serving to turn our Linux box into a far better

companies are combining Linux with free Web servers, such as Apache, to support their Web sites.

"If companies are looking for a cheap, easy way to set up a Web site, then the free model works pretty well," says John Parkinson, chief e-business technologist for Ernst & Young, which has an Internet consulting arm that tracks operating systems used by corporate Web sites.

The Alexandria, Va.-based publishing wing of the U.S. Army is using four Red Hat Linux servers to run free Web server software built by engineers at Northwestern University.

The Web site hosts more than 3,000 Army publications and handles up to 6,500 hits per day. Army systems administrator Joe Klemmer says his reasons for going the Linux route are pretty consistent with the Linux community's party line.

"It's all about cost, performance and having as little downtime as possible," he says. "Isn't that what everybody is looking for, regardless of your size?" ■



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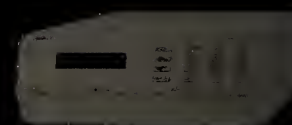
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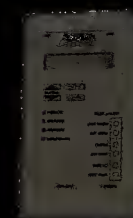


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Briefs

■ Eicon Technology last week introduced a modem for laptop users that offers **V.90 and ISDN connectivity from a single board.**

The **DIVA Mobile V.90 PC Card** is a PCMCIA card that allows Windows 95, 98 and NT notebook users to connect at 128K bit/sec over ISDN or up to 56K bit/sec when using an analog phone line.

Pricing and availability information was not released.

© Eicon: (514) 745-5500

■ Netopia last week introduced **R3100, an ISDN router** that can be upgraded to accommodate higher speed remote access links such as digital subscriber



Netopia's **R3100** can handle digital subscriber line and cable modems.

line and cable modems. **R3100** includes an integrated eight-port hub and an ISDN Basic Rate Interface port. Two analog phone ports are optional. Software upgrades also add support for AppleTalk routing. Prices range from \$585 to \$790.

© Netopia: (510) 814-5000

■ **IBM** has announced that it is **transferring its ADSTAR Distributed Storage Manager operations from its Storage Systems Division to its Tivoli Systems subsidiary effective Jan. 1.** With the transfer, IBM plans to further enhance its enterprise systems management offerings with investments in integrated storage products ranging from mainframes to notebooks, including cross-platform storage-area networks and application-centric products, IBM says.

In-Site: Lessons from leading users

Children's Hospital shines light on net problems

By Jeff Caruso
Boston

The biggest problem facing network managers at Children's Hospital was that they were often in the dark — literally and figuratively.

Scattered throughout Boston, the hospital's 22 campus buildings lose power frequently resulting from changes the city makes to the power grid. Many times, network managers at Children's were unaware that the power in another building on the network had failed until after the fact.

"Power is our No. 1 source of downtime," says Jim Hutchinson, Children's network manager. "Our power grid is always being manipulated, and we're not always privy to when power changes have been made."

Worse, network managers often were unaware when batteries were low or dead in the uninterruptible power supplies (UPS), which the hospital had installed on hubs and other key network equipment to guard against power failures.

Because of the battery problem, when power went

inson decided to take a proactive stance.

To avoid further problems and reduce downtime, Hutchinson focused on two key areas: He wanted to know when a UPS was in danger of failing, and he wanted to

about \$40,000, which included consulting and software. In addition to TelAlert and NerveCenter, the software includes the Windows NT Server platform on which they run.

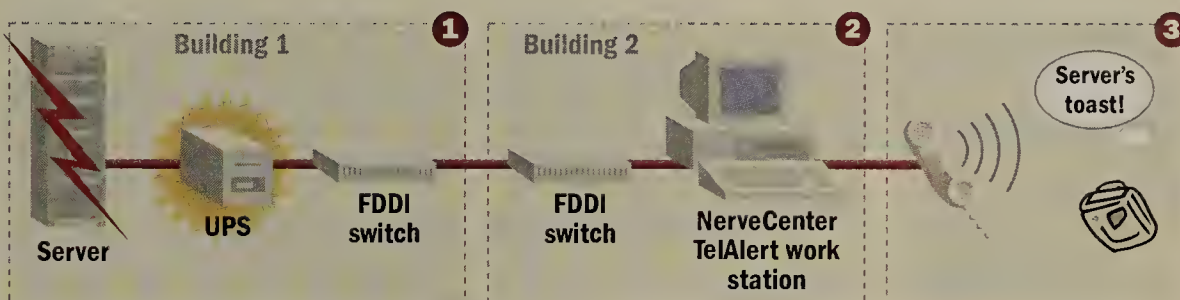
"I'm not a big fan of enter-

Managers can start to track down the source of problems and possibly warn users that they can expect a slowdown in the network until a problem is resolved.

Uptime is crucial at Children's. The metropolitan-area

STAYING IN TOUCH

The IT managers at Children's Hospital wanted to be more aware of network failures. Plagued by power failures in buildings throughout Boston, the hospital installed NerveCenter and TelAlert to stay on top of things.



Power goes out in Building 1. UPS kicks in as a backup.

A NerveCenter station in Building 2 receives message that UPS in Building 1 was activated.

If problem is considered severe, the workstation pages an administrator via TelAlert.

"I'm not a big fan of enterprise management platforms. . . . NerveCenter isn't trying to be everything to everybody."

Jim Hutchinson, network manager,
Children's Hospital

out, the network took longer to recover. And managers didn't know there was a problem until users started calling the help desk.

Earlier this year, Hutch-

watch link utilization.

The hospital called on Predictive Systems, a consulting firm in New York, for help.

Predictive installed Seagate's NerveCenter, software that collects information about network problems in a central location, lists which users and devices will be affected by those events, and highlights events that could be the root of problems.

The company configured the UPSes to send SNMP messages to NerveCenter when power fails or their batteries are low, says Steve Mastroilli, regional vice president at Predictive.

When utilization on a link becomes high — say, above 85% — network managers are notified by e-mail. When a power failure or other critical event happens, network managers are notified by an automatic paging system from Telamon called TelAlert, which Predictive integrated with NerveCenter.

The whole package cost

prise management platforms," Hutchinson says. In the past, he had tried platforms such as Hewlett-Packard's OpenView and IBM's NetView. But he didn't think they provided enough features for the money.

"NerveCenter isn't trying to be everything to everybody," he says.

The software focuses on correlating network events and basic polling, and that's enough, Hutchinson says.

By correlating the events it receives from the network, NerveCenter can point out events that are all symptoms of the same problem.

It now takes half as much time to resolve problems as it did without network management software, Hutchinson says.

Monitoring utilization lets the managers head off user complaints. If link utilization is high, it's often caused by a bad network card or a large image transfer, Predictive's Mastroilli says.

network connecting the hospital buildings uses FDDI for redundancy, with Digital GIGAswitch FDDI switches forming the backbone. Desktop systems connect to the backbone through 10/100M bit/sec Ethernet switches.

In the future, the network will have to handle desktop video and other imaging applications. Hutchinson says that will prompt the hospital to look at Layer 3 switches to handle that traffic.

In any case, network managers at Children's are now able to shed a little light on what's really going on in the network.

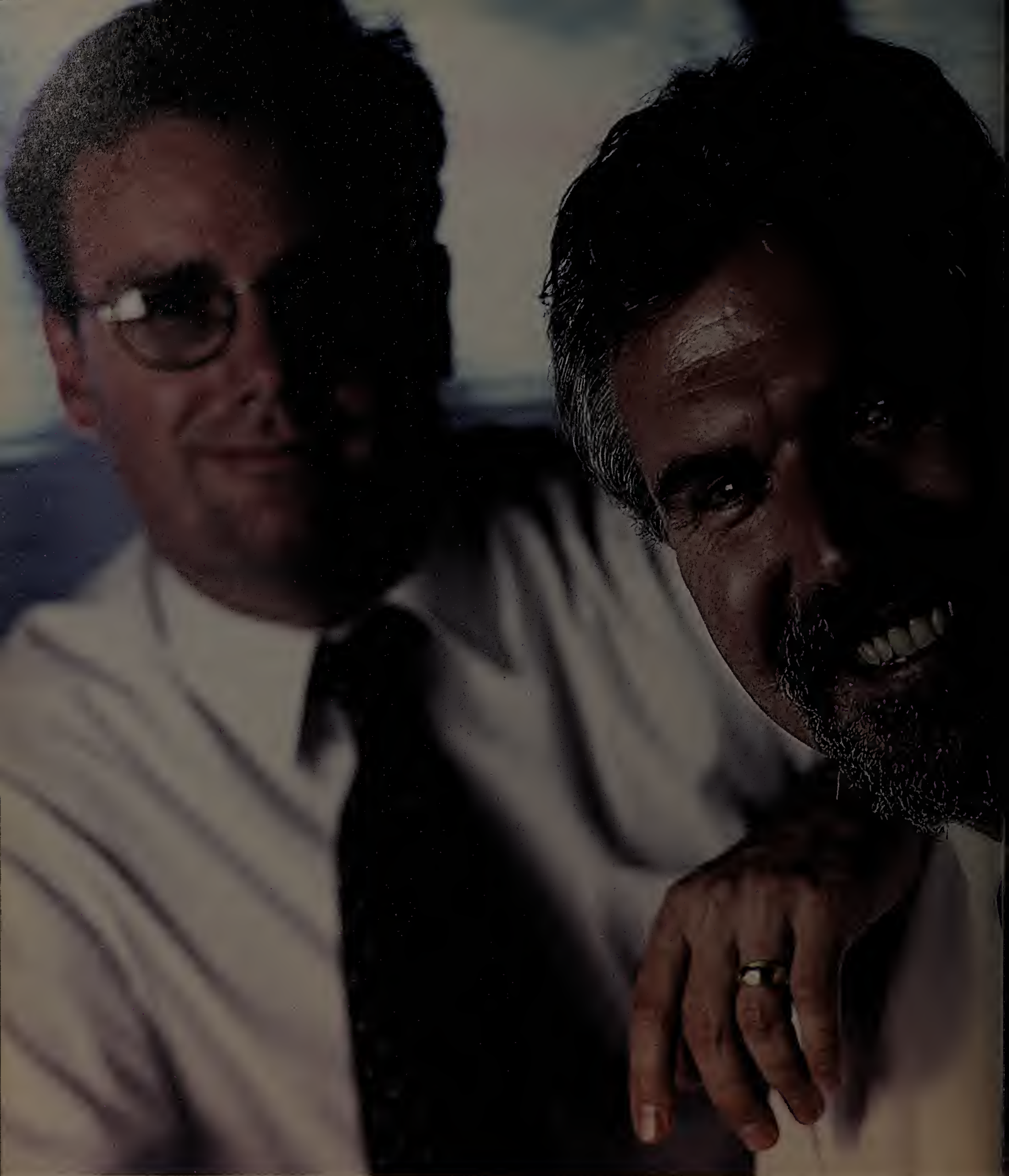
"We don't miss anything anymore," Hutchinson says. ■

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- NerveCenter overview.
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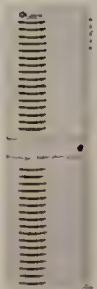
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INTERNETWORKING MONITOR

The prioritization paradox

There is only one way, yet there are many ways."

— Anonymous

Although that maxim might easily

pass for philosophical guidance from some Far Eastern mystic, it is not. Rather, it is the essence of an apparently paradoxical statement emanating these days

from the mouths of LAN switch vendors when they profess their bandwidth prioritization beliefs. Allow me to explain.

"There is only one way . . .

When it comes to the question of how Ethernet, Fast Ethernet and Gigabit Ethernet frames should be tagged to indicate a desired level of priority, all ven-

dors agree there is only one way. That mechanism is the IEEE 802.1p standard, which uses a field defined by the IEEE 802.1Q standard to tag Ethernet frames. I don't know any vendor that is opposed to the ratification and acceptance of this standard. Clearly, using the bits defined in 802.1p is the accepted, multi-topology, multivendor method of explicitly indicating priority in a frame.

. . . yet there are many ways."

Appropriately, this sounds somewhat mysterious. To put a diabolical spin on it, these "many ways" are proprietary, non-standard approaches to an alternative method of prioritizing traffic without using or setting any priority bits. To be fair, I should note that there are no standards available to implement. We might call this alternate approach "implicit" prioritization. The paradox referred to in the quote is that many vendors actually promote the use of 802.1p for priority tagging, while simultaneously promoting so-called policy-based approaches that don't use 802.1p at all.



Kevin Tolly

The situation becomes less confusing when considered on another plane. In the explicit prioritization approach, which is based on 802.1p, intelligence in the endstation tags each and every outbound packet that requires special treatment by the network. The result is "network-aware applications."

When implicit prioritization is implemented through proprietary policy-based schemes, the endstations take no action. Rather, intelligence located in the switching core automatically enforces prioritization policy by analyzing traffic streams in real time and queuing it accordingly. The result, vendors say, is "application-aware networks."

What we have may no longer be a paradox, but it qualifies as a quandary—neither approach is without problems.

Implicit prioritization counts on the fact that it can see inside packets to decide what to do with the data. However, as users implement secure features, such as IP Security, on campus LANs, implicit prioritization will hit a brick wall because it can't see inside the packets.

Because explicit prioritization relies on a new standard, it's not backward compatible with existing endstations, network interface cards (NIC) and switches. It may require significant expenditures of time and money to bring existing gear up to date.

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (732) 528-3300, ktolly@tolly.com or www.tolly.com.

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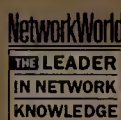
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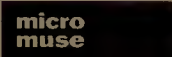


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Briefs

■ **Intermedia Communications** and **Williams Communications** have agreed to link their frame relay networks with several 45M bit/sec Network-to-Network Interfaces (NNI).

Under the deal, Williams gets a license to use ViewSpan, Intermedia's management package that provides performance detail down to the permanent virtual circuit.

Intermedia is a frame relay specialist that has grown largely via NNIs to Bell companies' frame networks. Williams is a wholesaler offering frame relay and other user services via resellers.

■ **Cable & Wireless executives** are moving on.

Earlier this month it was announced that Richard Yalen, CEO of Cable & Wireless, is leaving the company "to pursue other opportunities" and that Dennis Matteucci is taking over the CEO helm.

Former MCI executives Howard Hempenius, assistant vice president of Internet marketing; Bruce Gudenberg, director of Cable & Wireless' Internet product marketing; and Robert Hoskins, senior manager of corporate communications, are also leaving Cable & Wireless.

Cable & Wireless acquired MCI's Internet business over the summer.

■ **Frontier Communications** says it will install 32-channel dense wavelength multiplexing in its national network.

The equipment, which splits traffic along a single fiber strand into multicolor bands, is being provided by Pirelli Cables and Systems.

Frontier is a national long-distance and local carrier emerging out of what was once the local telephone company in Rochester, N.Y.

GTE finally jumps into VPN services fray

By Denise Pappalardo
Cambridge, Mass.

If secure, manageable VPN services are what you seek, then long-awaited offerings from GTE Internetworking may be for you.

MIT/Gate and Shiva LanRover VPN Gateway Plus devices at their dedicated VPN sites. The products will sit behind a user's router to encrypt and decrypt traffic traveling over the VPN.

VPN Advantage will feature

testing VPN Advantage.

Authorizing clients with security features that stretch beyond simple password and challenge scenarios is a key requirement in setting up Crown's VPN, says Miguel Montanez, group manager of IS at the Baltimore oil company.

Crown's 400 to 450 remote workers will be sending financial information over the company's VPN, so Montanez wants to also be sure that the traffic is encrypted when sent over GTE's network.

Users should also expect reliability with GTE's service-level guarantees.

For example, service-level agreements for dedicated VPN Advantage customers promise 99.9% availability and a guarantee that users will not experience more than 125 msec of round-trip latency on GTE's network.

The company plans to credit users 1% of their monthly service charges for every .1% of missed availability, says Robert McKinney, director of VPN services at GTE Internetworking. For example, a customer paying \$1,795 per month whose connection was only available 99.1% of the time in a month would be credited \$143.60.

VPN Advantage also guaran-

tees that dial-up customers will connect to GTE Internetworking's network 97% of the time.

All VPN Advantage customers will be able to access real-time information about their VPNs on a special GTE Internetworking Web site. Users will be able to request reports, determine usage, establish trouble tickets and even revoke digital certificates almost instantly.

Dedicated VPN Advantage is slated for availability in January and is priced at \$1,795 to \$3,295 per T-1 port depending on usage. The monthly fee also includes all digital certificates, 24-7 network management and monitoring, and a VPN device. Dial-up VPN Advantage costs \$39.95 per user for 30 hours of usage per user, which is combined into a total pool of hours for a company.

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THE GROWING POPULARITY OF VPNs

New and developing services will increase VPN spending 76% by the end of next year, according to International Data Corp.'s recently released "Internet Service Provider Market Review and Forecast" report.



The ISP last week announced VPN Advantage, a service that will let remote users connect to their offices around the country via GTE Internetworking's Internet backbone or the Internet using dedicated T-1 lines or dial-up analog connections.

Virtual private network (VPN) service customers will have the option of deploying preconfigured TimeStep PER-

strong security with 128-bit key encryption and X.509 digital certificates. The ISP is also teaming with two companies — its sister company, GTE CyberTrust, and Entrust — to act as a certificate authority. A certificate authority is in charge of authenticating and authorizing user access to VPN resources.

Security is one of the reasons Crown Central Petroleum is

Bell Atlantic delays long-distance entry

By David Rohde
New York

It now appears certain that the third anniversary of the Telecommunications Act of 1996 will come and go in February with no regional Bell operating company authorized to enter the long-distance business.

Officials at Bell Atlantic recently confirmed the company will not file its long-awaited application to enter the long-distance business in New York state by year-end. Bell Atlantic inked a provisional long-distance agreement with the New York Public Service Commission (PSC) last spring but has put off the decisive step: a filing with

the Federal Communications Commission.

Tom Tauke, Bell Atlantic's senior vice president for government relations in Washington, D.C., says Bell Atlantic now plans to file with the FCC by February.

Bell Atlantic's delay dooms chances for the industry and regulators to point to RBOC long-distance progress when the telecom act's anniversary rolls around Feb. 8. The act, among other things,

was supposed to make it easier for RBOCs to get into long distance, provided they met certain conditions.



Bell Atlantic's Tauke: Long-distance or failure in 1999.

Under the law, the FCC gets 90 days to review RBOC long-distance applications. The FCC has already rejected five such applications, and no RBOC has an application pending at the FCC.

Tauke says the blame should rest on existing long-distance carriers. For example, AT&T has

demanding that the PSC include unrealistic procedures in the ordering test. As a result, Bell Atlantic must test whether it can provide 130 different combinations of network elements.

"You could not find an unbiased industry expert who would say that the vast majority of those combinations will ever be used," Tauke says.

AT&T officials retort that Bell Atlantic and other RBOCs have deliberately avoided filing long-distance applications at the FCC because it would involve opening their local markets too much.

Tauke brushes that accusation aside. "If we don't get into long distance in 1999, it will be considered a major failure for everyone," Tauke says. ■

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EYE ON THE CARRIERS

ATM is alive and well and living with frame relay

How often have you wanted to go back and check the predictions of analysts and the press for accuracy? Many of them would be hilarious, I'm sure.

Well, here's one, but it's not for laughs. It's a report from Forrester Research about wide-area ATM services dated April 3, 1995. The headline: "Wide-area ATM

stalled until 1998."

Take a bow, Forrester. For once, someone got it right on the money.

After years of disappointment, ATM

as a wide-area user service is taking its place at the table. Many carriers report that ATM growth far outstrips that of frame relay. Users are more likely than ever to say they're installing ATM interfaces at data centers and major branch sites.

One of the most prescient things Forrester's 1995 report pointed out was that for all its multimedia capability, ATM's growth was dependent on the data network needs of corporations.

Back then and to some extent today, the critical applications requiring ATM's even flow of fixed-cell-length datagrams were lacking. At mid-decade, it was becoming clear that videoconferencing, for example, was just not becoming mainstream enough in corporate America to justify a widespread migration to a new WAN protocol.

Instead, it's been the simple crush of data applications that have led users to move to ATM because it's the state of the art today for T-3 and higher corporate links.

In the early days, ATM was supposed to be the follow-up to frame relay. Now it is common to implement ATM with frame relay. For example, if the carrier offers frame relay-to-ATM interworking, sites requiring 56K bit/sec to T-1 connectivity can use frame relay-equipped customer premises equipment, while T-1 to T-3 sites can use ATM-equipped CPE.

Journalists can see this shift reflected in the way ATM is presented by its evangelists. In 1994 and 1995, ATM applications were invariably pictures of the ocean floor, rotating X-rays of sick patients' innards and other new-day-dawning presentations meant to wow politicians as much as anyone else. Today users almost apologize for how boring their ATM applications can be.

We should be clear what we're talking about here. ATM hasn't taken over the world. These aren't usually people who have brought ATM to the desktop. And the adoption of ATM in corporate networks is taking place on a different path than the raging debate between ATM and pure IP in carrier networks.

In addition, the voice story has changed. Voice has indeed turned out to be a boon to ATM, as corporations have become comfortable taking their internal phone calls off the public telephone network — so long as they don't replace it with another type of toll system, such as certain voice-over-IP offers.

So welcome back to the fold, ATM. Now if the carriers don't price it out of the reach of the normal user's pocketbook . . . Well, that's another story.

Rohde is a senior editor with Network World. He can be reached at drohde@nww.com.

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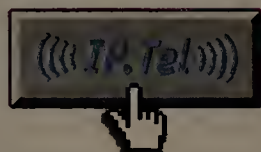
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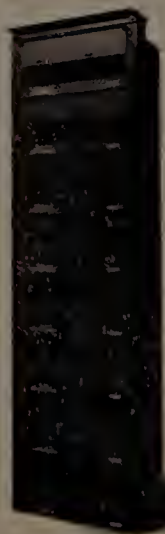
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Briefs

■ **A Lotus SmartSuite tool** that lets non-technical customers manage, edit and update simple Web



Lotus FastSite adjusts for users without technical savvy.

pages will soon be available for users of other productivity suites, such as Microsoft Office. **FastSite 2.0** will help end users upload desktop documents in a variety of formats to a Web site without the aid of a Webmaster, Lotus claims.

A 30-day trial version is available from the Lotus Web site (www.lotus.com/fastsite). The product sells for \$99.

© Lotus: (617) 577-8500

■ **Caching vendor InfoLibria** has announced a new technology that will bring players of streaming media closer to end users, avoiding bottlenecks and latency. The product, called **MediaMall**, is a specialized media player appliance that is placed at the cable-head end in a cable system, or at the point of presence in an ISP, to help smooth delivery of streamed content.

© InfoLibria: (781) 398-0288

■ **ThingWorld.com**, formerly **Parable**, last week announced **Streaming Media Things**, a server tool that brands and protects multimedia content on the Internet. Its counterpart, the **ThingViewer** client, allows you to view animated Web objects. **ThingViewer**, which works with the Microsoft Windows Media Player to support streaming audio and video, protects the copyright by not allowing the content to be changed.

© ThingWorld.com: (617) 796-0860

It's raining load balancing devices

HydraWeb, Alteon, HolonTech and F5 Labs all launch new load-balancing products.

By Robin Schreier Hohman

A slew of new load balancing products promises to let users do everything from apportion traffic across the Internet to what one company is marketing as "Layer 7 routing."

HydraWeb Technologies is the Layer 7 routing champion, touting this capability in its redundantly named HydraHydra offering.

The \$50,000 device is designed to oversee networks of smaller HydraWeb load balancers, which like other such devices sit between hubs or routers and servers and are responsible for distributing traffic evenly across the servers.

HydraWeb claims its new offering can identify traffic by viewing content at the application layer — Layer 7 — of the Open Systems Interconnection stack. This could give customers the fine-grained traffic direction needed to ensure quality of service for time-sensitive applications such as streaming video and Internet telephony.

HydraHydra also differs from other load balancers by including Java tools that enable enterprises and ISPs to parcel out traffic across WANs.

Alteon Networks is also adding WAN load balancing support to its Ethernet server

switches. The company is issuing new software — dubbed ACElerate 5 — for its ACEdirector 2 and ACEswitch 180 switches. The software will allow Web site providers to maintain copies of a site in different locations.

Also new on the load balancing front is HolonTech's Hyper-

that starts at \$9,990. This is a 266-MHz Pentium II-based rack-mounted system with 64M bytes of RAM (upgradable to 1G byte of RAM), two 10/100M bit/sec interfaces (upgradable to Gigabit Ethernet or FDDI), and full SNMP management capabilities.

It's not surprising consider-

tomers should also fuel sales.

For instance, since MapQuest stitched its Web servers into a cluster front-ended by a load balancer nearly 18 months ago, the company has been able to cut in more than half the number of servers it needs to draw 2.5 million maps daily.

Before using F5 Labs' BIG/

A load of new load balancers

Company/product	Product description	Price
Alteon ACElerate 5	Enables Alteon ACEdirector and ACEswitch devices to distribute traffic across WANs	\$3,000
F5 Labs BIG/ip LB	Entry-level load balancing switch	\$9,990
HolonTech HyperFlow 2	Eight- or 16-port load balancer	\$18,000 to \$25,000
HydraWeb HydraHydra	Central site device able to balance traffic across WANs	\$50,000

Flow 2, the result of the merger of two existing HyperFlow products into one that can be configured with eight or 16 ports.

HyperFlow 2 can cluster NT, Unix or NetWare servers on one or more ports. Other features include server failover, an improved Web-based management console and HTTP redirection, which handles the forwarding of certain requests to cache servers for faster processing.

Separately, F5 Labs has announced BIG/ip LB, an entry-level server load balancer

ing the market projections being bandied about that vendors are tripping over one another to introduce new load balancing products.

For example, Collaborative Research of Los Altos, Calif., expects the market to grow eightfold over the next three years, hitting the \$300 million mark by 2002. Electronic commerce is among the biggest drivers behind this technology, according to Peter Christy, principal analyst at Collaborative.

Good results from early cus-

ip2 server load balancer, MapQuest relied on the round robin Domain Name System to allocate server requests among multiple servers.

But using this method to distribute requests doesn't account for servers being busy or down, according to Marc Haverland, director of Internet engineering at the Denver interactive mapping company.

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Netscape jazzes up e-commerce offerings

By Paul McNamara

Mountain View, Calif.

Upgrades and additions to Netscape's CommerceXpert family of electronic commerce applications will help cus-

tomers broaden their business-to-business Internet trading, according to the vendor.

Available immediately, the server-based products announced last week include ECXpert 2.0, ECXpert Enterprise 2.0 and TradingXpert 2.0, a new offering that lets companies host online trading communities. With its acquisition by America Online pending finalization, Netscape is pushing the trio as a group that will let companies swap e-commerce information securely over the Internet with a variety of trading partners. The

products also provide new connections to a customer's existing electronic data interchange and enterprise resource planning applications.

New features in ECXpert 2.0 include support for the emerging EDI over the Internet protocol, cross-company process automation and transaction audit and control capabilities. ECXpert Enterprise 2.0 features a new software developer's kit for extending ECXpert functionality. Stephanie Miles, general manager at BridgePoint, a subsidiary of shipping giant

CSX in Cary, N.C., says the existing Netscape products have helped her company connect multiple trading partners that use a variety of software systems. "Inside ECXpert is a translator that allows us to handle a bunch of different [data and transport] formats," Miles says. "ECXpert really enables us to not care about those things."

ECXpert is priced at \$75,000 and ECXpert Enterprise costs \$50,000. The new version includes optional integrators: \$30,000 for SAP R/3; \$20,000 for Oracle Applications; and \$20,000 for IBM's MQ Series.

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NET INSIDER

A glass seven-eighths full

Fellow *Network World* columnist Mark Gibbs knows what he is talking about most of the time, but that's not the case in his column on the

ICANN (NW, Nov. 30, page 68).

Gibbs wrote that the Internet Corporation for Assigned Names and Numbers (ICANN) plan appears to

make "almost no one happy." I may be biased because I've been involved with the Internet naming system issue for the past two years or so, but my view of the ICANN is rather different from Gibbs'.

As Gibbs reported, the ICANN is a private nonprofit corporation that has been created to privatize the functions of the Internet Assigned Number Authority.

Jon Postel managed the latter organization until his recent death.

The ICANN, in its current form, is the result of negotiations between Postel, Network Solutions and the U.S. government. Like most products of extensive negotiation, the purity of the ICANN's design can be hard to find. But the new organization is basically true to Postel's vision of having the Internet's infrastructure managed, at least in part, by technical experts.

Discussions about exactly what shape the ICANN would take have involved three groups of people. There are those people, mainly from the technical and ISP communities, who are in strong agreement with what Postel was trying to accomplish. There is a group of people who support Postel's basic ideas but have had issues with some implementation details. And there are those who do not like the basic ICANN concept itself. Many commentators seem to confuse the views of the last two groups.

The best way to summarize the difference between my view on the ICANN and Gibbs' is to look at the transcript from the mid-November ICANN meeting that Gibbs mentions in his column (see <http://cyber.law.harvard.edu/icann/archive>). I was among the 200

people of varied backgrounds who attended that meeting. Attendees included representatives of the three groups mentioned above as well as quite a few people who just wanted to see what was happening.

Mark Luker of Educause, a nonprofit association of 1,600 colleges and universities, elicited the most applause at the meeting when he said: "Our members believe that the present board, the interim board and the bylaws are an excellent start. We would urge that we get on with this business."

Whereas I prefer to recall the applause, my fellow columnist prefers to focus on the repeated complaints of a small minority.

Even though the board made changes to the ICANN bylaws to address many concerns expressed by attendees worried about specific implementation details, I would not claim that the ICANN is perfect. It is a glass seven-eighths full.

It's unfortunate that Gibbs aligns himself with those who see the glass as empty because they disagree with the basic concept of an Internet run for the benefit of the community rather than for just a few.

Disclaimer: Some Harvard people were involved in the ICANN meeting. In spite of that, the above is my opinion.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.



Scott Bradner

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Due to growth within my company and the need for specialized departmental servers such as Microsoft SQL Server, our server farm is beginning to grow. Management is concerned about having to buy additional tape backup drives for each server and has asked me to investigate other options. What should I look for?

Via the Internet

You have a couple of options, each of which has pros and cons. On the positive side, by having a backup drive at each server, traffic would be contained within that server rather than getting onto the network. You also would limit your exposure. If the backup drive failed, problems would occur only at that server. The disadvantage is you would have to configure a backup job on each server. Depending on the size of your server farm, that could be a daunting task.

You could buy backup capacity for your network from a company such as Intel. The purpose of a device with this capability would be to back up specified servers on a regular basis or on demand. The potential disadvantage is you may have only limited or costly options for expanding the capacity once you've acquired the base unit.

An easier option would be to construct your own backup server. I recommend using a Redundant Array of Inexpensive Tapes (RAIT) system. Compaq offers a RAIT system that has an interesting benefit: A minimum of three tape drives are required to perform a backup. Just as with RAIT's sister, Redundant Array of Inexpensive Disks, one of the tapes could fail or come up missing and you could still restore a badly needed file.

Bringing redundancy to Layer 3 switching

By Charlie Kraus

Resiliency and redundancy are critical qualities in today's LANs. From the resiliency of load-balancing server network interface cards to the redundant fabrics and power supplies of backbone switches, LAN technologies continue to make high-availability networks more commonplace.

prefer to use statically configured default gateways to reduce processing overhead in the end system. The risk of this process is that a router serving as a default gateway becomes a single point of failure, and failure can spell catastrophe for end systems that rely on the default gateway for WAN connectivity or access to

The master

When VRRP is turned on, one of its first duties is to provide the master router with a virtual media access control (MAC) address, one that can be taken over by the next-in-line backup. (VRRP allows for more than two routers, but two is the most likely scenario.)

by the user; the VRRP default is 1 second.

If the advertisements suddenly stop, the backups set interval timers, typically for three times the advertisement frequency.

If no further advertisements appear, the backups assume the master is down and the failover routine is activated. From that point, the election of the next-in-line master typically takes less than a second.

Meanwhile, each router must report its status regularly to the network management console via SNMP. Network management may also be alerted if the VRRP packets show anomalies in any other areas — for instance, if a normal handshaking error occurs or authentication fails.

Providing protection

Although it is a relatively simple protocol, VRRP is effective protection for networks with statically configured gateways. And while some end systems employ discovery tools for locating new gateways in case of failure, VRRP represents a far more efficient solution to the problem — VRRP applies intelligence to the network rather than to the end system. Compared with the alternative — setting and managing individual discovery protocols in each of the network's end systems — VRRP is an efficient, simple technology.

On a macro level, VRRP represents another step organizations can take toward high-availability computing.

Years ago, organizations concentrated their resiliency/redundancy efforts largely on their data center systems and servers.

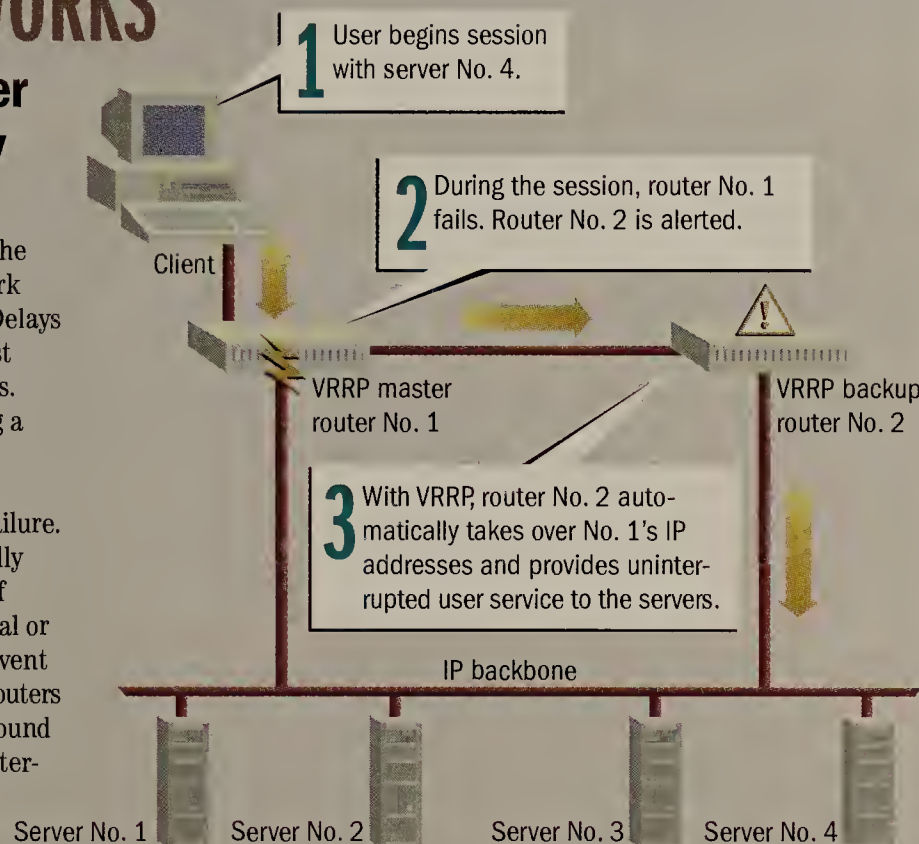
Now organizations are realizing that high-availability computing requires high-availability network.

Kraus is product marketing manager for Layer 3 switching at 3Com. He can be reached at Charlie_Kraus@3Com.com.

HOW IT WORKS

Virtual Router Redundancy Protocol

Network downtime is the bane of most IP network managers' existence. Delays can cost millions in lost productivity and profits. The IETF is developing a multivendor standard protocol to resolve the problem of IP router failure. VRRP lets users logically define virtual groups of routers around a central or master router. In the event of a failure, VRRP lets routers automatically route around failures, ensuring uninterrupted net operations.



Now, thanks to the IETF's Virtual Router Redundancy Protocol (VRRP), the same qualities are coming to Layer 3 switches and routers that serve as statically configured default gateways.

Determining the default gateway is the first step in routing data from one network domain to another. Some end systems use dynamic route discovery protocols, such as Open Shortest Path First (OSPF) or Routing Information Protocol (RIP), to determine their correct default gateways. OSPF and RIP are able to circumvent any failed outages to come up with the optimum gateway.

But many organizations

other LAN domains.

VRRP is designed to guard against such failures, and to do so with a relatively simple, efficient architecture. And although dynamic route discovery protocols are able to locate a new default gateway, VRRP provides for faster and more efficient failover in the event of an outage.

Furthermore, the protocol functions in load-sharing applications, as well. For example, VRRP lets a router act as a master for one IP subnet and a backup for another that has its own master. Two routers configured this way can load-share, with each router acting as a redundant backup for the other.

MAC resides at Open Systems Interconnection Layer 2 and represents a device's physical identification; switches know where to forward IP packets by relating the IP address to the MAC address of the next-hop switch or router. By employing a virtual MAC address, VRRP ensures that end systems won't need to change their default-gateway address in the event of failover. In fact, end systems won't notice that a backup has taken over for the master.

Key to VRRP's operation is a process in which the master router sends a special VRRP packet, known as an advertisement, to the backups. Advertisement intervals can be set



Bell Atlantic a no-show for our Frame Relay Showdown

Three weeks ago, I challenged six top frame relay providers to take part in our ComNet Frame Relay Showdown in January, and I'm happy to report that five of the companies were quick to accept the challenge to debate in Washington, D.C.

AT&T, Sprint, MCI WorldCom, Intermedia and US WEST have agreed to take part in this presidential-style debate. But, inexplicably, Bell Atlantic — which markets frame relay service in the nation's capital — missed our deadline for committing to the event. The company didn't decline, it just couldn't pull together an answer in time.

Here are the speakers from the original invitees: Joe Lueckenhoff, product vice president for data network services, AT&T; Brad Hokamp, director of advanced data services, Sprint; John Scarborough, director, virtual data services, MCI WorldCom; Michael Johnson, senior director of enhanced engineering, Intermedia; and Janice Aune, vice president, operations for US WEST.

With one slot left open, I invited Infonet, a big international provider of frame relay. I mentioned the possibility of adding Infonet in an earlier editorial and the company — unlike Bell Atlantic — quickly jumped at the opportunity. Infonet will be represented by Tom Whidden, vice president of marketing.

resented by Tom Whidden, vice president of marketing.

I'm also adding Qwest to the mix. While the company isn't currently a big player in frame relay, a number of readers asked me to include it. Clearly, customers are interested in what this emerging player will have to offer (see our page 1 story this week). Qwest grabbed the chance and will be sending Ian Dix, vice president of data marketing.

The Frame Relay Showdown will be held at 1:30 p.m. on Tuesday, Jan. 26. During the debate, our intrepid service provider executives will face tough questions from a panel of industry experts, then will have the opportunity to grill one another before fielding queries from audience members.

If you're going to ComNet, get the Showdown on your schedule. If you are a current or prospective frame relay customer and you aren't attending ComNet, maybe you should rethink that decision.

For now, though, thanks to our service providers for taking the Showdown challenge. But what happened to Bell Atlantic? If you're a customer in the Northeast, ask the regional Bell operating company why it didn't rise to the occasion.

John Gallant, editor in chief

jgallant@nww.com

Privacy Matters • Cal Slemp

Electronic commerce success is a matter of trust

Have these things happened to you? You order an item from a friend's gardening catalog and suddenly find yourself inundated with gardening catalogs. You register some software you bought and the company wants to know the ages of your children. You pick up a couple of new shirts at a well-regarded retailer and even though you pay cash, the clerk asks for your phone number to close the sale.

It is understandable why companies want to know more about us. In an age when personalized service is increasingly attractive to consumers, statistics show that revenue is 50% higher on Web sites that cater to customer preferences. This same personalization can shut down the flow of information if a customer loses trust in the company he is trading with. In a recent survey, 80% of consumers said they'd change purchasing preferences if they thought personal information was improperly handled.

For a mutually beneficial relationship to work, companies must handle information responsibly. That's why a formal privacy policy is critical for any company that gathers customer data. It's a matter of trust.

A privacy policy is as simple as letting your customer know why you want certain information and how you plan to use it. It includes giving customers the choice of whether to release personal data by allowing them to opt out of providing the information.

A privacy policy can be as complex, however, as securing data storage systems and the networks you use for communicating; training your employees in handling information; and monitoring the practices you employ to support your privacy management. It's not enough to post a few words about privacy in your catalog or on your Web site. You must pay attention to procedures and physical systems that store and communicate data so your information systems have the strength and flexibility to accommodate business growth with integrity.

Any company that collects personal data faces the privacy issue, especially as pressure mounts for privacy compliance around the world. The European Union Directive on Data Protection legislation that took effect this fall presents the most immediate reason to understand how privacy issues affect business. Under the directive,

the European Union's 15 member countries cannot transmit information such as names, addresses and other personal data to any country that fails to provide data protection deemed adequate by the European Union.

In a global business environment, the European Union has acknowledged that privacy can be protected in multiple ways, not just the regulatory, centralized model that the European Union employs. This is important, especially for global networks such as the Internet, where centralized regulation is not warranted or even possible.

Discussions continue between the U.S. and the European Union regarding the details, but watch to see whether or not the European Union will go along with the U.S.'s approach: regulation for some kinds of sensitive information, business self-regulation in other cases. Notably, the Clinton administration has asked for voluntary compliance with certain privacy practices on Web sites, and American companies have moved fast to comply, organizing cross-industry groups such as the Online Privacy Alliance to adopt and implement sound privacy policies.

Regulation aside, the real and perhaps longer lasting pressure will come from customers, employees, suppliers, trading partners and shareholders. Without their trust, businesses will be in more trouble than any regulation might impose. Conversely, with the right policies and procedures in place, your company may fare better than the rest.

Slemp is global executive of E-business security and privacy at IBM Global Services. He can be reached at cslemp@us.ibm.com.

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

WEST is not best

Your article "Can't get enough DSL" (Nov. 16, page 55) really hit the mark. I am a US WEST customer, and I cannot begin to express the discontent I feel about its service and the rate at which new technology becomes available.

I have no other choice in selecting my carrier. I do have the option of selecting an ISP, but US WEST has put limits on this, too. I requested the new MegaOffice asymmetric digital subscriber line connection from US WEST in October. To this day, I have not received a project/order number or noti-

What the AOL/Netscape deal really tells us

The America Online/Netscape deal proves that we've missed some key truths in the way we've looked at the Internet. It also tells us that we'll be looking at a very different kind of Internet in the future.

Everyone wants to see the 'Net as an exploding social and technological revolution. If so, it's a selective revolution. While stock values of firms such as Amazon.com and Yahoo have been soaring into the stratosphere, ISP stocks have been positively pedestrian.

The trouble with the ISP business is that everyone is thinking up things that can be done for free on the Internet. Push technology firms want to push information to you. Retailers want to sell to you. You get support for products on the World Wide Web. You get help for your social life on the Web.

Now people want you to move your private network applications onto the Internet. The pushers, sellers, chatters and tunnelers will all make money, but the poor ISP gets nothing but more traffic — traffic that, in a flat-rate model of Internet pricing, doesn't earn the ISP a dime.

Here's where AOL comes in. Why is AOL buying Netscape instead of a company such as PSINet, Concentric or UUNET? The answer: advertising. Among the online providers, only AOL offers a controlled client interface. With standard Web browsers, you decide which pages to visit and view content only from those pages. With AOL's controlled client, you see ads when it wants you to see them. This scenario means that AOL can sell ad space, something Yahoo and Amazon.com can do as well, which is why their stocks are flying high.

Ad space is how you get television programs. Ad space is how you get this publication. Selling ads is lucrative enough to support the whole broadcast industry. It's enough to send stock values of search engine firms skyrocketing. It's what AOL could do that other ISPs can't, and ISP advertising is coming to you.

AOL and Netscape say their cooperation will facilitate electronic commerce. E-commerce as in Web sites that promote product sales? Been there, done that. E-commerce as in ordering online? Done that, too. What we haven't done is figure out a way to push commerce-inducing advertising to everyone. Many of the basic tools are there in enhancements to browsers such as Java, but the details need to be developed. You can bet that when AOL and Netscape talk about e-commerce, it's e-advertising they are really focusing on.

Before you pull out your protest signs from the 1960s and start picketing, consider two facts. First, the Internet really has been about commerce and marketing

from the start. How many sites, of the millions of Internet hosts, are really there just to educate humanity, and how many are there to sell something to humanity? All AOL/Netscape will do is let ISPs cash in on the process a little.

That leads to the second fact: Without some form of subsidization, the Internet isn't going to spread to every home and grow in access speeds to the megabit level.

People just won't pay enough to ensure the survival of the ISPs, and ISPs are as essential to the Internet as Web content and users. But ISP advertising revenue could make up the difference between what we'll pay for Internet service and what the ISPs need to charge to be profitable.

The television analogy suits the Internet better than you may think. You can get commercial-free television two ways: public television, which is contribution or tax subsidized; and pay-per-view. The same will eventually be true for the Internet.

Users who pay for the privilege will receive fast access, no advertising — whatever they want. The rest will have to watch the network channels, meaning they'll have an interface to the Internet that enables push advertising to intrude on their experience.

Users will also be limited in what they can access. Basic Internet service in the future will be the 'Net with commercials and nothing more . . . unless ads can be sold in chat

rooms and via e-mail.

So what do we do as AOL and Netscape prepare to step into this commercial-dominated future? The answer: think and pay. We've all been captivated by a lot of advances in the Internet that are completely unrealistic in a business sense. Digital movies on the Internet via digital subscriber line? Sure, for a couple of thousand dollars per month — or a couple of thousand commercials.

We want to believe those who say bandwidth is free or that somehow rolling public telephony and other applications onto the Internet is going to eliminate the "pay or watch the ads" trade-off.

Because we won't face reality, we can't hope to guide progress toward it. AOL and Netscape are sounding a warning: Regulate the commercialization of the Internet or let the sellers do it for you.

Choose, America. Time is running out.

Nolle is president of CIMI Corp., a technology assessment firm in Voorhees, N.J. He can be reached at (609) 753-0004 or tnolle@cimicorp.com.



fication of when the service will be installed. I've called every possible office to find answers, but no one has any information on scheduled installation time. I was told my central office has come and gone "out of capacity" once, and it will likely happen again before I receive the service. My paperwork is in a pile, waiting for the digital subscriber line access multiplexers and wiring build-up, but I don't know if I'm one of the fortunate few expected to receive the service.

In several phone conversations with US WEST, I've been informed that 64 new ports were being added this go-round, while several hundred people are waiting for the service.

*Jeffrey Maxwell
Portland, Ore.*

It was disappointing to see two very misleading statements in your article "Can't get enough DSL."

One statement says flatly that

"DSL doesn't provide a secure point-to-point connection." The fact is that most products in this market use PPP sessions from the customer site to the ISP, and these are carried in ATM or frame relay permanent virtual circuits (PVC) from the customer site to the ISP router. Many users are sharing a physical port on a router, but that port has a subinterface for each user. Some product lines do aggregate the traffic onto a single PVC at some intermediate point in the network but with each PPP session now in its own Layer 2 Tunneling Protocol tunnel to maintain privacy.

The second error is the statement that digital subscriber line (DSL) "can't be deployed in subloops that are connected to the central office via fiber"

except in the relatively low-speed ISDN DSL form. It is true that many vendors have been concentrating on central office-based installations that offer plentiful space and environmental controls, and significant economies of scale. However, there is no technical reason keeping asymmetric DSL (ADSL) from being deployed at fiber-fed remote sites. There already are ADSL access multiplexers that work in these settings, and more are on the way.

*Joe Callahan
Manager, data network engineering
Engineering Associates
Atlanta*

False prophet?

Thanks to Mark Gibbs for his pointed column regarding Nicholas Negroponte ("Internet Time: Old wine, new bottles,"

Nov. 16, page 94). Negroponte fancies himself to be an Internet prophet, yet he lacks the eloquence, insight and vision necessary to pull it off.

I read *Being Digital* in 1996. The first thing Negroponte says in the book is that he is dyslexic

and never liked to read books. Since then I have always referred to the book as *Being Dyslexic*.

*Oliver Brown
Marketing associate
E.On Interactive
Santa Cruz, Calif.*

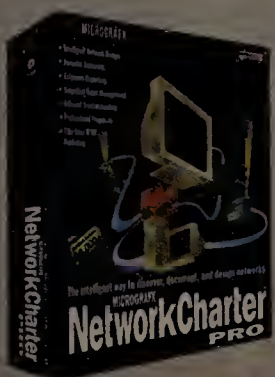
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SOLID PREPARATION CAN MINIMIZE THE COST OF AN ENTERPRISE MANAGEMENT SYSTEM ROLLOUT.

Cutting costs, not corners

By Dave Buerger

There's no getting around the fact that enterprise management system (EMS) rollouts carry exorbitant price tags, but smart preparation goes a long way toward reining in costs.

The packages alone cost a few hundred thousand dollars, and analysts say you'll spend at least three to 10 times that amount implementing the system. Get the most for your money by spending some time prepping your network for management. This upfront effort lets you retain stronger control over vendors and consultants, complete the project faster and save a nice chunk of change.

EMS implementers estimate that better preparation could have saved them 20% to 33% of the total deployment cost, representing savings of a few hundred thousand to several million dollars for typical large installations.

A little planning helped 1-800-FLOWERS control costs when the company deployed Computer Associates International's (CA) Unicenter TNG.

"We saved over 25% of the implementation costs through careful preparation," says Guru Ghosh, director of IT at the Westbury, N.Y., company. "I had a smart guy working full-time with CA. I knew the price would be higher if we gave the entire project to the vendor."

Getting a handle on what exactly to prepare isn't trivial. Vendors, analysts and chief information officers say IT professionals should focus on staff roles and management-related processes.

Technical consultants and network managers closer to the action disagree. They say their biggest challenge is taming the ever-changing mix of network technology and information systems.



Kalpesh Unadkat, senior consultant at the University of Michigan Medical Center, says discovery tools aid EMS deployment.



No one denies that enterprise management is complicated — and frustrating. The EMS market totals about \$16 billion, according to Paul Mason, vice president of infrastructure software research at International Data Corp. in Framingham, Mass. Yet about half of EMS software ends up as unused shelfware within 24 months of purchase, says Ray Paquet, research director for software infrastructure at Gartner Group in Stamford, Conn.

EMS is so puzzling that by one measure, hardly anyone has figured out how to implement it successfully. According to a recent Gartner Group study, after 18 months of trying, 70% of major EMS implementations either failed or weren't doing everything the vendor had promised.

Executives from EMS vendors Cabletron, CA, Hewlett-Packard, IBM's Tivoli and Sun deny that they sell flaky software, and several quickly disassociate their firms from the 70% failure rate. Instead, manufacturers blame the companies that bought their products, citing a litany of things that users do wrong.

All the vendors agree, however, that advance preparation by network managers is valuable before installing or upgrading EMS software.

"Understanding what should be managed and why makes a smarter customer," says Paul Allikas, director of consulting services at Tivoli in Austin, Texas.

Prepare a network map

"The majority of failed network management products can be attributed to poor preparation," says John Dyte, a member of the technical team at AT&T Wireless Services in Redmond, Wash. Dyte's team manages 3,000 devices on AT&T's network using Sun's Solstice Enterprise Manager and HP OpenView.

Dyte emphasizes the need for a physical map diagramming interrelationships among all network components.

EMS vendors offer a variety of software and techniques for discovering network devices. Most EMS platforms identify devices at the IP layer, which can spell trouble if devices lack the proper software to answer a management platform's discovery call.

"Solstice Enterprise Manager can discover only something running SNMP," says Andy Taylor, group marketing manager of network management products at Sun. "It can ping devices, stepping through them and trying to figure out IP numbering. But in some cases, the pinged device may not be a discovered device. That could be a problem."

Undiscovered devices result in network maps that are logical instead of physical, delivering the software's best guess at what's out there. To complete the picture, users can manually ferret out network devices or buy a special discovery tool.

Kalpesh Unadkat, senior consultant at the University of Michigan Medical Center in Ann Arbor, recommends purchasing software that can determine if SNMP is installed and what operating system each router is using. Unadkat uses Cabletron's Spectrum to manage 50 routers, 200 hubs and switches and 200 servers.

Pierre Fortin, network manager for the Canadian Department of Defense in Ottawa, tried several products before buying a Web-based, real-time physical network-mapping tool called Kinnetics from Loran International Technologies. His network consists of about 2,000 managed devices.

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- A network management Buyer's Guide.
- Stories about implementing enterprise management systems.



"Kinnetics is the only product I found that tells me what needs fixing before the network can be managed," Fortin says. "It automatically discovers devices at the media access control layer instead of the IP layer, showing me all the traffic between all the devices, which devices have duplicate IP addresses and invalid SNMP implementations, and the specific sources of other problems."

Make devices manageable

Finding everything on your network is just the beginning. Once accounted for, nodes require attention. The first step is ensuring manageability by installing a uniform version of SNMP on each

device. Unfortunately, manual setups via telnet sessions into each device can require hundreds of hours for large networks.

You'll also need to upgrade the firmware installed in each hub, switch and router to the same level. Even different versions of the same operating system, such as Cisco's Internetwork Operating System, can support SNMP and Remote Monitoring Management Information Bases in different ways. "It's less of a headache to support one operating system version instead of multiple versions," Unadkat says.

Moreover, each network device needs a unique IP address. Duplicate numbers used within the same network will cause addressing problems. The same holds true for subnet bit-mask numbers used to subdivide an IP network. Mismatched subnet bit-masks result in unexpected traffic patterns or incomplete transactions. Maintaining consistent naming conventions is particularly important for large international organizations, Tivoli's Allikas notes. "Naming tends to be done differently from division to division or site to site," he says.

Sloppy use of SNMP community strings is another source of network management headaches. A community string is a primitive password that allows EMS software to talk to devices via SNMP. Device managers typically use department names for strings, according to Glenn Gianino, technical evangelist for network and security at CA in Islandia, N.Y. Gianino knows this from experience: He spent two decades managing large-scale networks for CA, Grumman Corp. and IBM. "Management is a problem with 50 or more strings, especially if naming is poor," he says.

Lack of a well-thought security policy can also strangle EMS implementations. "Router 'jocks' often do not turn on SNMP due to security exposure," Gianino says. Determining who can use SNMP and how they use it requires closer communication between the network manager and people who control physical devices.

Cooperation and communication among different groups of technical people are essential. Just

EMS PLANNING CHECKLIST

- ✓ Appoint an EMS implementation champion.
- ✓ Buy preparation tools, such as discovery and mapping software, protocol analyzers, and network capacity planning and modeling software.
- ✓ Make sure all network devices are manageable by installing proper software and making sure each uses the same version.
- ✓ Clean up IP addresses and subnet mask numbers and resolve related organizational process issues.
- ✓ Create a physical network map.
- ✓ Analyze the risk of network points of failure and prioritize devices for management.
- ✓ Set device polling intervals and alarm thresholds.
- ✓ Determine who will receive alarms and what recipients will do with the information.
- ✓ Project future capacity requirements and build them into the EMS project plan.
- ✓ Crystallize project workflow, milestones, definitions of success and budget.
- ✓ Get adequate training.

as technical problems impede a rollout, turf wars among IT staffers can throw a wrench into EMS implementations.

"The process problem is a serious one," IDC's Mason says. "You cannot expect to have success in a major project that turns management practices upside down without having an organizational and cultural impact."

Someone within the organization must have centralized control over the elements required for effective EMS implementations and operations. "What causes madness is when the network grows quickly and several people are authorized to make changes to numbering, naming and security conventions," says Jeff Norton, manager of network operations at Time Warner's Turner Broadcasting System in Atlanta. "Centralizing authority and being methodical is essential to keep things under control."

But focusing exclusively on internal processes also has drawbacks. Gianino says network managers must consider electronic commerce's "downstream liability" as a factor in EMS implementations. Downstream liability refers to additional traffic on a network stemming from computers operated by a company's business partners. One of CA's customers had 70 business partners linked to its main network but had no idea that the partners were using its bandwidth, he says.

Hidden roadblocks effectively throttle the best management efforts. One process that underpins every EMS project is determining what to manage, where to set alarm thresholds and who will do what with the information dispatched by the EMS. Trying to manage everything on a network might be overkill.

"If someone's PC goes down, maybe they just turned it off," says Ted Power, a Network Node Manager technical product specialist at HP in Fort Collins, Colo. "Do you call that person and say, 'Your PC is not working?' This could be a waste of energy."

It's boom time for EMS consulting businesses

In facing the complex labyrinth of enterprise management system (EMS) options, network managers follow the rest of corporate America's lead: They hire a consultant.

"Users share a responsibility to design the right enterprise management system," says Jack Collins, director of network management products at Sun. But, he adds, "customers with complex environments most likely cannot do this without outside help." Such assistance is available from Sun's Enterprise Services, which reported more than \$1 billion in annual revenue as of June. The consulting division is the fastest growing segment of Sun's business.

Sun isn't alone. Major EMS vendors are gearing up professional service offerings in an effort to make installations more successful. Hewlett-Packard says about 2,500 people worldwide help install OpenView, including staff from third-party partners. HP hired eight new systems integration firms last spring to service OpenView.

IBM's Tivoli uses 4,000 professionals worldwide to help install Tivoli Enterprise, up from 2,000 at the

end of last year. Tivoli partners include Deloitte Consulting, Ernst & Young and Perot Systems. On top of beefing up their service organizations, Computer Associates International, HP, Cabletron and Tivoli have each announced programs in recent months aimed at easing the installation of their respective management products — the programs are usually a combination of new processes, tools and software.

Finally, big systems integrators are also entering the EMS arena. Some provide services in conjunction with a vendor, while others tout independent consulting services.

For example, MCI Systemhouse offers Neptune, an independent, six-part program for analyzing, optimizing and managing large networks.

With all these people and businesses focused on EMS, users' expectations are bound to rise. For if this army of helpers cannot quickly make EMS work — at a reasonable price — nothing can. Platforms must succeed now or vendors will risk serious dissatisfaction among users.

— Dave Buerger



Q

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Risk assessment based on business priorities usually determines what the EMS should manage, according to Bill Gassman, senior research analyst at Gartner Group. "Network managers should ask, 'What risk do I have of

something failing? Why might it fail?' And, 'What's the return on investment going to be if I'm spending \$100,000; is it going to affect my business by \$500,000?'"

You also need to choose the right

hardware to support EMS, according to Paul Edmunds, senior network analyst at Duke Energy in Charlotte, N.C. He recommends specifying the number of nodes to poll; the size of the database and storage systems; the per-

son who will get management views; the person who will operate the system and how he will receive information; and whether you'll centralize or distribute management. Edmunds manages 300 routers and 1,400 switches and hubs with OpenView.

"You must define true hardware, software and people costs to avoid budget surprises," Edmunds says. "Planning requires a strong stomach because this can get expensive with distributed platforms."

Getting EMS to work

Identifying and resolving EMS preparation challenges unique to your organization are steppingstones toward the ultimate goal of making it all work. Don't be shy about educating upper management about the roadblocks in the way of this objective. Managing expectations is an essential part of EMS implementation.

"Operational people must speak up," says Rich Ptak, vice president of solutions for enterprise management at D. H. Brown Associates in Port Chester, New York. "Many CIOs think they know more about computers than they do," IDC's Mason adds. "Consequently, the top businesspeople often underestimate how difficult IT is."

Controlling those expectations, setting project milestones and ensuring technical specialists stay on course requires a project champion. "You need someone who will own the project and be responsible for day-to-day implementation to avoid 'project creep,'" says Jerome Simms, Cabletron's Spectrum engineering manager for Canada in Toronto. "The project needs to be that person's focus for the duration. He or she cannot be doing half days on the project and half days on another job."

This type of solid, upfront EMS preparation can deliver huge payoffs. Tivoli's Allikas offers a "conservative" cost savings estimate of 25% to 50% in complex situations. Quicker implementation is another benefit. The company says better customer preparation would cut the typical Tivoli implementation from a range of three to six months to just three to six weeks.

If your company is one of the 70% that had trouble implementing enterprise management or if it is about to take the plunge, you might consider seeking the counsel of Dave Passmore, president of NetReference, a Sterling, Va., consulting firm. "By doing all the right technical and process preparations, you'll have higher probability of successfully applying EMS tools. Better that than giving up," he says.

Buerger is a freelance writer in Palo Alto, Calif., who has consulted for several companies mentioned in this article. He can be reached at dbuerger@pacbell.net.



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Presented by Mark A. Miller, P.E.,
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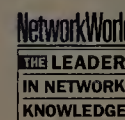
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- Understand the key driving factors behind the Voice over IP initiatives: client applications and economic benefits
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- Understand how Quality of Service (QoS) issues become key factors for a successful multimedia network implementation
- Understand how network traffic patterns can impact a Voice over IP implementation
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REVIEW

DESPITE ROUGH EDGES, DATACHANNEL'S RIO LETS USERS BUILD A CORPORATE INTRANET AND VIEW ITS CONTENTS.

Save it on Rio

By Christopher Null

The "Amazon" may be big on the Internet, but another river is making a push for the intranet.

DataChannel's Rio is a content management system that lets users publish HTML content directly from applications such as Microsoft Word and Excel. Published pages are automatically loaded into areas defined by an administrator — for example, one for the marketing group and another for sales. The areas, called channels, are then viewed through a browser by authorized intranet users.

The Rio system works well and provides simplified tools for publishing and managing intranet information. Rio makes it easy for users to contribute to the publishing process and helps ease the support burden for administrators.

Defining users and channels

The first step after installing Rio on a server is to build user profiles, which the product utilizes to control access and publishing rights to intranet channels. While Rio imports user information from the server's Windows NT domain, it doesn't transfer group information — an unkind

software. Users simply point their browsers to the Rio home page on your intranet and select one of three client versions to load. One option is a standard HTML version that provides basic functionality. There's also a Power version, based on Java and JavaScript, to give you all the bells and whistles. Finally, an Active Channel version is available for people who use Microsoft's Active Channel. (We haven't met any of them, but we presume they're out there.)

True to its name, the Power version is the most functional client, and most users will want to employ its enhanced features, such as real-time notification of content updates. The Active Channel client, on the other hand, is not nearly as user-friendly as we'd hoped; we relied on the Power client to get our work done.

If users want to publish content, they need to install the Save to the Web client, a utility that makes it simple for users to publish their own Web content without the aid of a Webmaster. The utility enables users to publish content simply by copying files to a new Save to the Web

Net Results

RIO 3.1

DataChannel

(425) 462-1999, www.datachannel.com

Starts at \$9,500, Windows NT; \$14,500, Unix

PROS

- ▲ Simple installation
- ▲ Powerful search engine and extensibility features
- ▲ Intuitive content publishing tools

CONS

- ▼ Documentation is inaccurate and out of date
- ▼ Client software is unstable
- ▼ Netscape browser is poorly supported

seamlessly importing user information and eliminating the need to remember yet another password to use the intranet.

Rio also sets up Open Database Connectivity and SQL names and settings needed for storing your data. Although you need to tweak a few Web server settings by hand, most of the defaults are fine.

Rio performed acceptably but was not especially fast on our server, which has the minimum requirement of 64M bytes of RAM. We recommend a server with 128M bytes or more.

The system's documentation, on the other hand, is unacceptable. The Rio 3.1 manual is wrong in many places and is apparently a holdover from some older version. DataChannel's online help is also wretched, consisting

of one File Not Found message after another. Fortunately, Rio can be set up without much guidance, but if you want to use its advanced features, you'll likely feel at sea.

Current users of Rio will find the free Version 3.1 upgrade a no-brainer. The main enhancement over Version 3.0 is increased functionality of the Save to the Web technology. This release also includes

much-needed searching capabilities, an improved installation routine and better extensibility through "jump-start" kits for integrating Rio with Microsoft Index Server, Microsoft Active Server Pages and Lotus Notes.

Intranet administrators looking for a platform to build a corporate portal should be quite happy with Rio. With its ease of use, it's one of the better intranet publishing products on the market.

Null is co-author of the upcoming Complete Networking Desk Reference. He can be reached at null@sirius.com.

Get more online:

See our test methodology on Network World Fusion.



Score Card

	Features (40%)	Client usability (20%)	Server manageability (20%)	Performance (10%)	Installation and configuration (5%)	Documentation and online help (5%)	Total score
Rio 3.1	8 x .40 = 3.20	6 x .20 = 1.20	8 x .20 = 1.60	6 x .10 = 0.60	7 x .05 = 0.35	2 x .05 = 0.10	7.05

Individual category scores are based on a scale of 1 to 10. Percentages are the weight given each category in determining the total score.

omission on the part of DataChannel's developers. We had to repopulate groups by hand.

With our users defined, our next step was to build channels, which are simply areas for stored content. DataChannel supplies a few dozen predefined templates as a guide. This let us easily build common intranet channels for information, such as benefits data, an IS help desk and corporate policies. Rio also can automatically pull Channel Definition Format information off Internet Web sites for re-publication on your intranet, making it easy to populate your intranet with news, weather and business information. You'll want to take advantage of all this prebuilt functionality; building channels manually means designing Web pages from scratch.

After assigning permissions to access and modify our channels, we were ready to let users start building content. Rio requires no special client

icon (which looks like a Windows Explorer disk drive icon). Just copy a file to a folder (which represents a channel) within Save to the Web, and the new content is instantly available to all of that channel's subscribers.

Rio 3.1 lets users publish information directly from within Internet Explorer or Windows Explorer, although separate add-ons are required for each. We found the Internet Explorer version to be a bit unstable and slower overall.

Netscape Communicator users are left out in the cold by Rio's Internet Explorer-centric feature set. Communicator users cannot use any publishing features, and using Communicator to access the Rio intranet was a generally unsatisfactory experience, replete with problems such as disappearing content when we resized the window.

Installing Rio 3.1 is relatively painless. The system integrates with your Windows NT domain,

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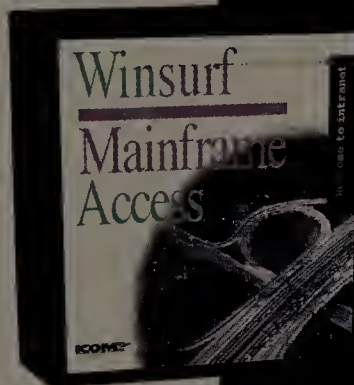
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* Source: International Data Corporation

FOUR DUAL-CPU PENTIUM II WORKGROUP SERVERS SHOW GOOD PERFORMANCE, BUT ONLY TWO ARE WORLD CLASS.

Honor systems

By John Bass, Network World Test Alliance

This round of four Pentium II workgroup server tests marks a first for any *Network World* review: Two contenders scored well enough to win our World Class Award. Sharing World Class honors are Compaq's ProLiant 1600 and IBM's Netfinity 5000.

However, that's no knock against the other two contenders. Toshiba's Magnia 3000 and Crystal Group's CS900 also proved to be solid performers. The main differences between all the units were in features, serviceability and price.

The ProLiant was a standout in terms of value, as well as of performance, especially in our file server tests. The Netfinity proved easy to service and troubleshoot, while likewise delivering good performance. As we did in our last round of server tests (*NW*, Oct. 19, page 85), we judged performance on a relative basis. The top server in each roundup received a 10, and the others were rated relative to its performance.



World Class Award

Compaq ProLiant 1600, on the strength of its exceptional performance, and the IBM Netfinity, by virtue of its super serviceability, get our World Class Award, which goes to products that earn 9.0 or more on our Score Card.

Score Card

	Relative performance (40%)	Features and flexibility (30%)	Manageability (20%)	Serviceability (10%)	Total score
Compaq ProLiant 1600	10 x .40 = 4.00	7 x .30 = 2.10	10 x .20 = 2.00	9 x .10 = 0.90	9.00
IBM Netfinity 5000	7.9 x .40 = 3.20*	10 x .30 = 3.00	9 x .20 = 1.80	10 x .10 = 1.00	9.00
Toshiba Magnia 3000	8 x .40 = 3.20	6 x .30 = 1.80	9 x .20 = 1.80	8 x .10 = 0.80	7.60
Crystal Group CS900	7.5 x .40 = 3.00	4 x .30 = 1.20	6 x .20 = 1.20	5 x .10 = 0.50	5.90

Individual category scores are based on a scale of 1 to 10. Percentages are the weight given each category in determining the total score. Performance is determined relative to the best performing server (10 = best). *Rounded



Compaq ProLiant 1600

The ProLiant took the top spot in the Web and file tests by a wide margin, thanks to its extremely efficient SCSI controller and network interface card (NIC) drivers, and scored second best in the SQL test. At

\$7,661, it was also the least expensive of all the servers tested.

The ProLiant's case design allows you to disassemble the server into several large modules that can be further disassembled if necessary. This type of design affords plenty of room to work on hard-to-reach components. The NICs are held in place with a flip-tab restraint instead of screws, which makes service easier.

The server's management features are similar to those of Compaq's high-end servers. Compaq Insight Manager integrates with many management platforms, including HP OpenView, Sun NetManager and Tivoli TME 10 Netview, and

provides early detection of possible hardware failure. An Automatic Server Recovery feature gives the server the ability to reboot itself when necessary according to conditions configured by an administrator.



IBM Netfinity 5000

The IBM Netfinity 5000 tied for the top spot in the review as a result of its fantastic serviceability features. It came in a close third in overall performance.

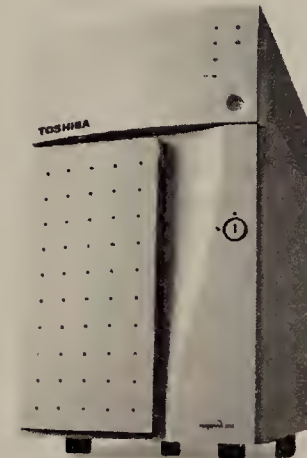
Netfinity takes serviceability to a new level. The case uses a toolless design — it has no screws at all. Everything comes apart with levers, making the unit very

easy to disassemble and reassemble.

The server uses strategically placed LEDs on the motherboard to mark failed dual in-line memory modules, CPUs, fans and other components. This light path diagnostic feature could save a lot of time in troubleshooting bad components.

The Netfinity also includes an Advanced Remote Management Processor (ARMP) on the motherboard to monitor the CPUs, fans, hard drives, temperature, voltages and memory. The ARMP can send alerts via an external modem or over the LAN. It also controls the light path diagnostic LEDs.

The bundled Netfinity Manager software works with the ARMP to deliver data to any SNMP-compliant enterprise manager. In addition to Netfinity Manager, the server comes with Lotus Domino and a CD-ROM that holds an installation aid, documentation, drivers and American Power Conversion (APC) Powerchute+ software to control an APC uninterruptible power supply.



Toshiba's Magnia 3000

The Magnia 3000 from Toshiba came in third in overall score but placed second in performance. It also took second place in the file and Web tests and rated third in the SQL test. It's reasonably priced at \$8,605, or about \$1,000 more than the Compaq ProLiant 1600.

The Magnia 3000 has a nicely designed case with a split bezel that allows you to lock the case and drives or restrict access to the unit as a whole, including the reset button and the CD-ROM and diskette drives. The hot-swappable disk carriers are well-designed and easy to use,

allowing the smooth removal and insertion of the drives. The case offers easy access to all the components and includes two redundant, hot-swappable, load-balancing power supplies. While you don't need tools to open the case, you do need some to remove the fans and a few other components. The Magnia's design is not quite as sophisticated as that of the IBM and Compaq servers.

Our unit came with an optional RAID controller in one of the PCI slots, which likely helped boost the product's performance score. But the fact that it used a 400-MHz CPU, while the other three servers ran at 450 MHz, probably lowered its performance at the same time, especially in our SQL tests.

The Magnia 3000 comes with Intel LANDesk Server Manager, with modifications to monitor the system board, CPUs, voltages, fans, error checking and correcting memory errors, temperature, hard disks and power supplies. An Emergency Management Port (EMP) is provided to remotely power on and off and reset the server. The EMP can also be used to dial out to alert the administrator to problems.



Crystal Group's CS900

Crystal Group's CS900 came in last on our Score Card and last in overall performance, though it did earn first place in our SQL tests. That factor indicates it's a good performer in terms of CPU power but lacks robust file subsystem performance.

The CS900 is compact and features an industrial-grade design. It's different from the other servers in this test in that it is designed to be kept relatively small and rack-mounted; 16 CS900s can fit in a single rack. This design makes it a good candidate for wiring hubs.

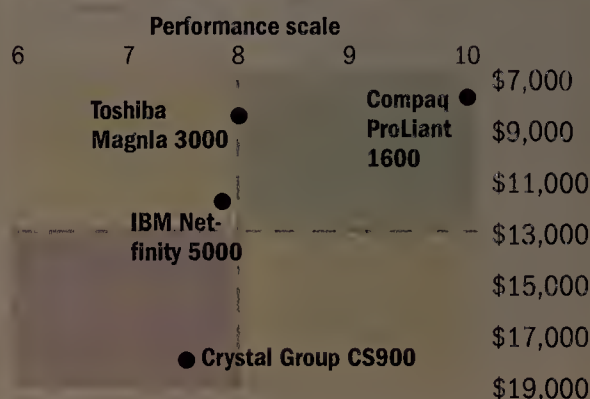
Redundancy is virtually nonexistent because the vendor believes in redundant servers, not redundant components within a single server. That philosophy would be easier to accept with a more attractive price — at more than \$17,000, the CS900 was the most expensive server in the review.

There are no hot-swappable disk bays in the CS900. A separate product is available from Crystal Group to integrate swappable disks. A cable management scheme is also available to

FEATURE AND CONFIGURATION TABLE

	Server Vendor	ProLiant 1600	Netfinity 5000	Magnia 3000	CS900
		Compaq (800) 888-0220 www.compaq.com	IBM (800) 426-7255 www.ibm.com/products	Toshiba (800) 867-4422 www.toshiba.com	Crystal Group (319) 378-1636 www.crystalpc.com
Price		\$7,661	\$11,592	\$8,605	\$17,750
Processor type		Pentium II 450 MHz, 512K cache	Pentium II 450 MHz, 512K cache	Pentium II 450 MHz, 512K cache	Pentium II 450 MHz, 512K cache
Number of processors		2	2	2	2
Number of processors supported		2	2	2	2
Memory configuration		256M bytes, (2) 128M-byte DIMMs	256M bytes, (2) 128M-byte DIMMs	256M bytes, (2) 128M-byte DIMMs	256M bytes, (1) 256M-byte DIMMs
Number and type of RAM slots		4 DIMMs	4 DIMMs	4 DIMMs	2 DIMMs
Expansion slots present		2 PCI; 4 PCI/ISA	3 PCI; 2 PCI/ISA	3 PCI; 1 PCI/ISA; 1 ISA	3 PCI; 1 PCI/ISA; 1 ISA
Expansion slots available		2 PCI; 4 PCI/ISA	2 PCI; 2 PCI/ISA	2 PCI; 1 PCI/ISA	7 PCI; 1 PCI/ISA; 1 ISA
Disk controller		Dual UltraWide SCSI Symbios 876 chipset on motherboard	Dual channel Adaptec 7895 UltraWide/UltraNarrow SCSI controller on motherboard; IBM ServRAID3H 3-channel UltraWide PCI RAID controller	Onboard Symbios UltraWide/UltraNarrow SCSI controller; AMI RAID controller	Adaptec 7880 UltraWide SCSI controller on CPU card
Hard drive description		(4) 4.3G-byte Cheetah UltraWide SCSI, 10,000 rpm	(4) 4.5G-byte IBM UltraWide SCSI, 10,000 rpm	(1) 4G-byte IBM UltraWide SCSI, 7,200 rpm; (2) 9G-byte IBM UltraWide SCSI, 7,200rpm	(2) 9G-byte Cheetah UltraWide SCSI, 10,000 rpm
Number and description of hard drive bays		5 1" or 2 1.6" and 1 1" hot-swappable; 2 1.6" fixed full-height	5 1" hot-swappable	4 1" hot-swappable	2 fixed
Network interface		Netelligent 10/100 TI TLAN chipset on board	AMD PC Net 10/100 on board	Intel Pro 100+ 10/100 on board	DEC 21143 10/100 on CPU card
CD-ROM		24X IDE	32X IDE	32X SCSI	32X IDE
Availability features		ECC memory; hot-swappable drives; redundant power supplies	ECC memory; hot-swappable drives; redundant, load-balancing power supplies	ECC memory; hot-swappable drives; hot-swappable power supplies and fans	ECC memory; watchdog timer for custom applications
Manageability features		Compaq Insight Manager; Automatic Server Recovery-2; Integrated Remote Console	Advanced Remote Management Processor; Netfinity Manager	Intel LANDesk Server Manager; monitoring of CPU, voltage, fans, ECC errors, temperature, hard drives and power supply; Emergency Management Port	Quick alert alarming system; CPU voltage, temperature, fan prefail
Security features		Power-on password; case and drive locks; keyboard password	BIOS password; one lock for drives, power switch and case	BIOS password; Split-level lockable door	BIOS password; keyboard lock
Bundled software		Smart Start; Compaq Insight Manager	Netfinity manager; CD-ROM server guide; Lotus Domino	LANDesk Server Manager; motherboard configuration tool; diagnostic utilities; CA Unicenter; server setup and NT fast setup	diagnostic disk
Warranty		3-year on-site, prefailure warranty on hard drives, RAM and processors	3-year parts and labor on-site next business day worldwide	3-year parts and labor on-site next business day	1-year part and labor on-site with advance replacement

PRICE/PERFORMANCE COMPARISON



Performance numbers are relative to the top-performing server, which is assigned a score of 10. The closer to the top right corner, the better the value.

handle the interconnect cables between the units in a rack.

The CS900 is difficult to service. You have to remove 12 screws to open the case. However, all

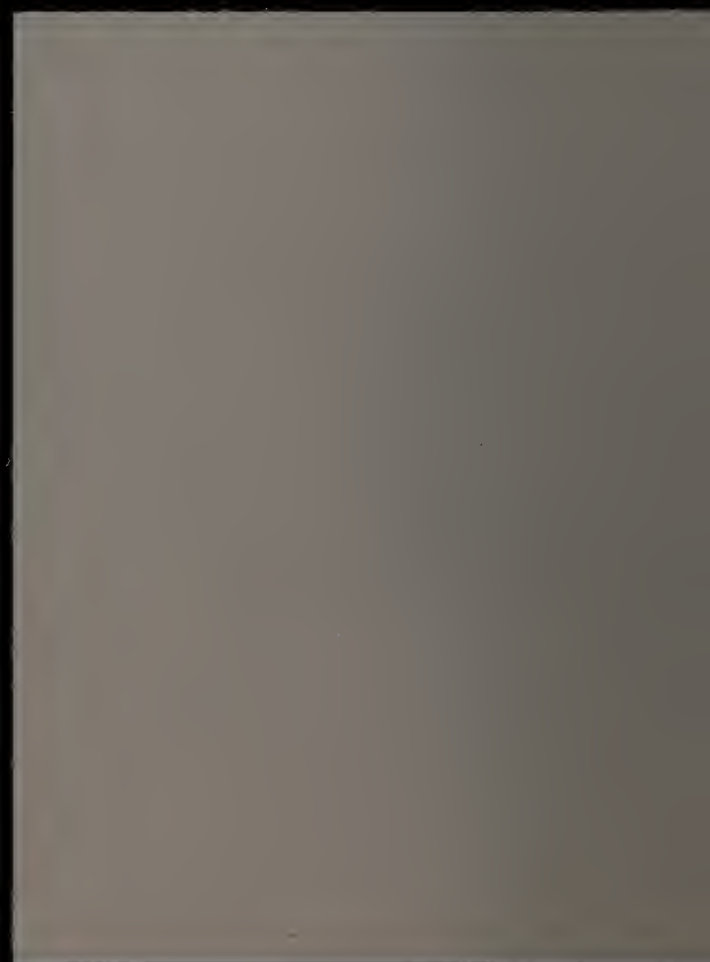
components except for the power supply and disks are on a single card, making it easy to swap in a new card and virtually replace the machine.

An alert system included with the server allows you to monitor the CPU, temperature, fan speed and voltages. With an optional SNMP add-on, the unit can be managed from any SNMP management platform.

Server testing is performed at North Carolina State University's Centennial Networking Labs (CNL) in Raleigh. CNL tests network equipment and network-attached devices for interoperability and performance. Bass, a senior technical staff member at CNL, designs and leads the execution of the test suites. He can be reached at john_bass@ncsu.edu. Simon Booth assisted.







Management Strategies

Civic lessons

Creativity is key to beating local governments' IT recruiting crises.

With six out of 14 positions open in his department, Ramon Padilla, IS administrator for Jefferson County in Louisville, Ky., is used to blowing project deadlines.

"We've been so short for so long that I kind of anticipate delays," Padilla says.

But blown deadlines aren't his biggest problem. Padilla and IT directors in other local government agencies are living their worst recruiting nightmares. Staff jobs remain vacant for months, even as long as a year, leaving existing employees stretched to the limit. The resumes that do filter in are often from candidates with little experience.

The problem stems from one thing — harsh competition with the private industry's higher salaries and sweet stock options. One IT manager estimates his county only pays 75% of market rate salaries, and another says private sector IT jobs pay as much as \$30,000 more than government positions.

As if that weren't enough, local governments have an unearned reputation for working on technology's blunt edge. Resuscitation is needed — and needed quickly. Municipal IT managers must get creative or watch their recruiting hopes evaporate.

The Seattle strategy

Lynn Jacobs, the new chief technology officer for the City of Seattle, is taking action. Faced with vacancies in 17% of the city's IT positions, up 3% from last year, she assembled a team of human resources professionals and IT managers to find a solution, an idea that had been previously shelved. Jacobs appointed Matt Lampe, director of enterprise technology for the city, as co-chairman of the group.

The committee's IT Human Resources Strategy Report, complete with proposed legislation, now sits before a receptive City Council. The report spells out the city's recruiting problems, citing dire predictions brought by the high-tech labor shortage. All this means one thing: Get in gear or watch city services suffer.

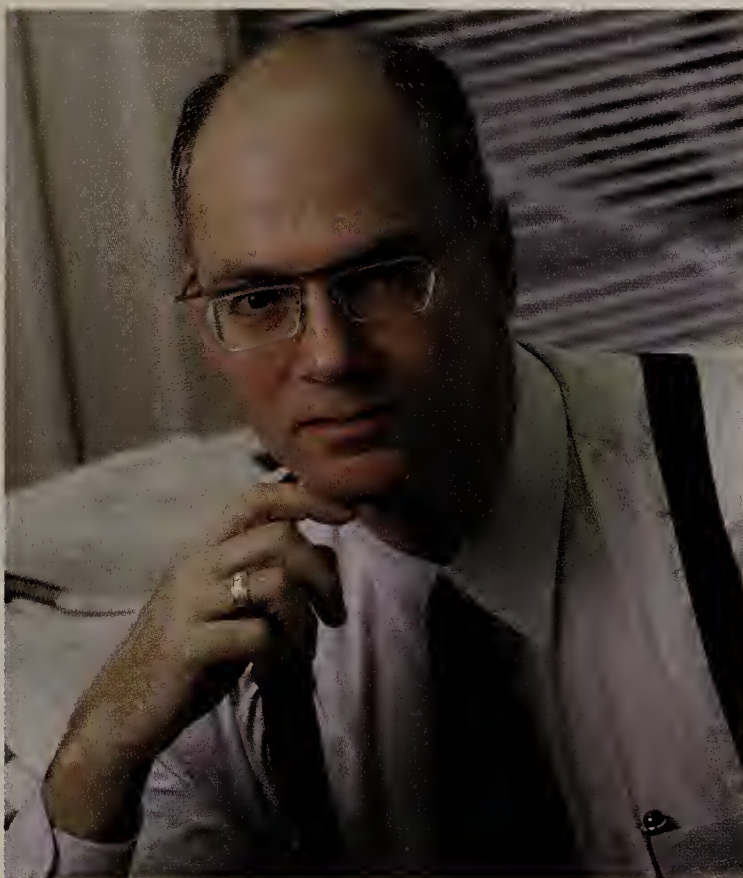
The team's answers to Seattle's recruitment problems are neither simple nor easy to implement, but they're realistic. The report details a flexible, increased salary structure for senior-level IT professionals.

"We won't compete dollar for dollar with private industry. But at the same time, we

By Loretta W. Principe

must be somewhere in the ballpark or candidates won't take us seriously," Lampe says.

Bumping up salaries alone won't cut it. The interdisciplinary team outlines a performance-



Matt Lampe, director of enterprise technology for the City of Seattle, aims to make the city's IT jobs more enticing by boosting pay.

based compensation plan — new territory for Seattle. "To get and keep people with technical skills, we have to recognize performance, which doesn't really happen in government," he says.

A two-day fix in Fairfax

To attract the top IT talent, you also need to sell the benefits of working for the government. These positions tend to offer decent, family-friendly hours, generous pension plans and vacation time, and the opportunity to quickly assume new responsibilities.

In the shadow of the nation's capital, well-to-do Fairfax County, Va., competes with international corporations, an abundance of high-tech companies and the all-encompassing federal government for IT professionals. While the county can't match private sector pay, the appeal of government work attracts job candidates.

Carlos Escobar, director of network computing and customer service for Fairfax County, sees applicants burnt out by heroic hours, frazzled by ugly commutes and searching for job security.

At the same time, Escobar is losing potential employees to a drawn-out hiring process. "Panels must be convened for every interview. Questions for the interview must be preapproved. It's very involved, very time-consuming. The entire process involves delay," he says. When network professionals can get new jobs tomorrow, they're not inclined to wait weeks. As a result, 18% of the county's IT positions were open as of last May.

That's when the county took the first step toward abandoning its bureaucracy by organizing a two-day "instant offer" job fair.

On the first day, approximately 130 attendees met with IT managers and viewed a presentation on the county's technical infrastructure. Managers worked late that night to review resumes.

Managers invited 30 candidates to return the next evening for small panel interviews. Hiring managers made 15 offers on the spot (subject to reference checks), and seven employees came onboard.

"Right now only 8% of our IT jobs are open. We've improved by being aggressive," Escobar says.

Jefferson County's Padilla also believes tenacity and creativity are key to recruiting. The county will soon establish an internship program with local community colleges and the University of Kentucky at Louisville in hopes of snagging prospects early.

And figuring he has nothing to lose, Padilla makes the best offer he can to candidates who are out of his price range.

"I'll call because I might get lucky," he says. "Hey, it's happened before."

Principe is a freelance writer and attorney in Springfield, Va. She can be reached at LWP@principe.com or mail@excite.com.

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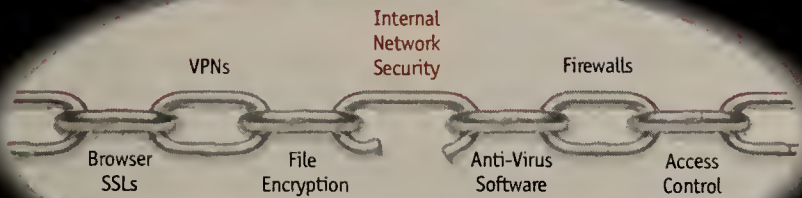
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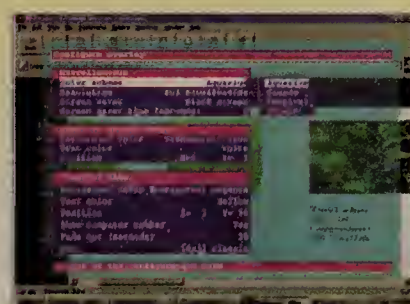
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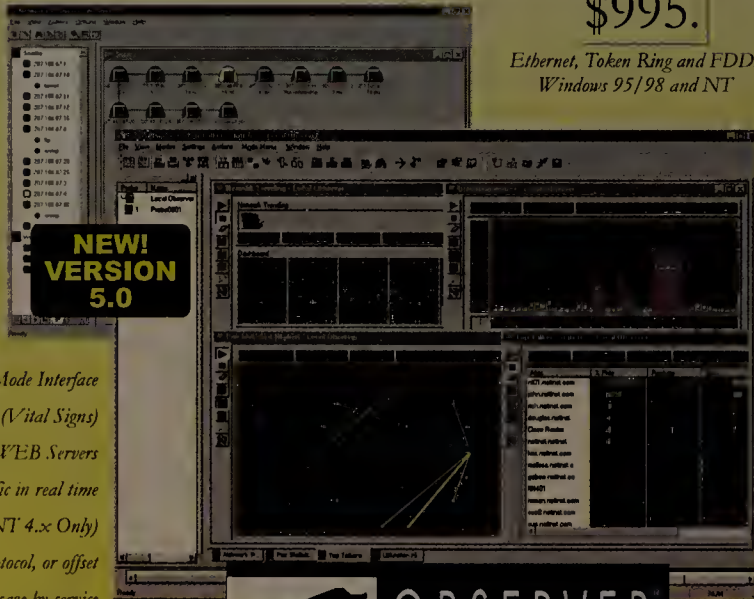
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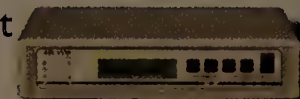
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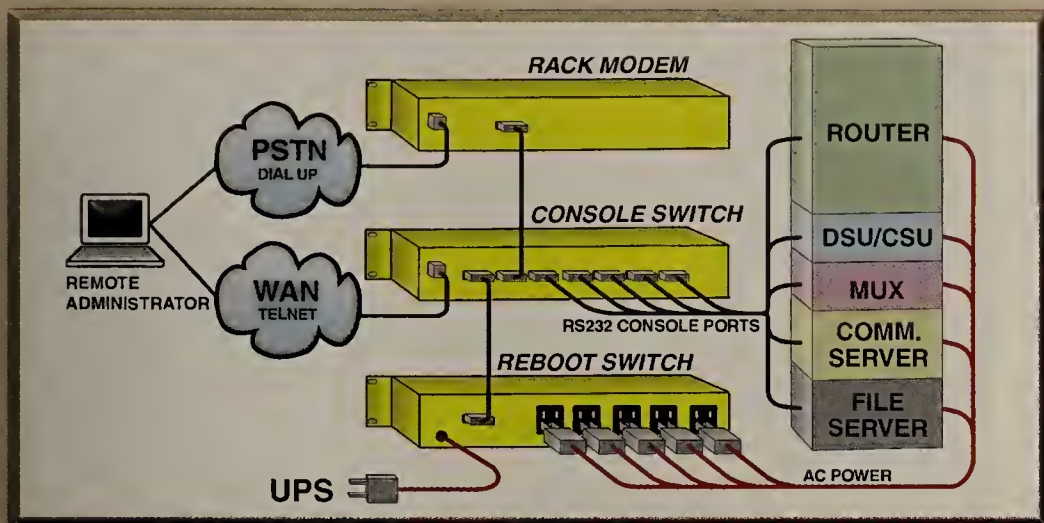
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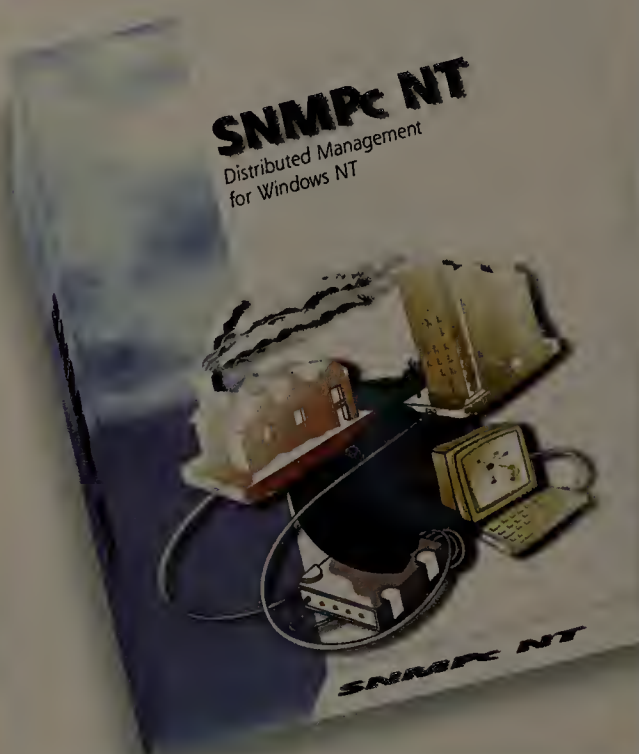
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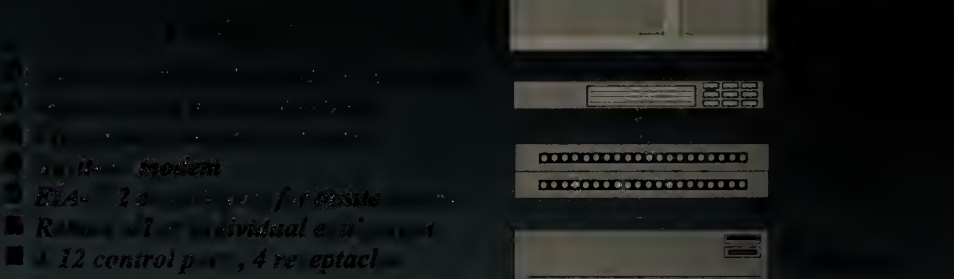
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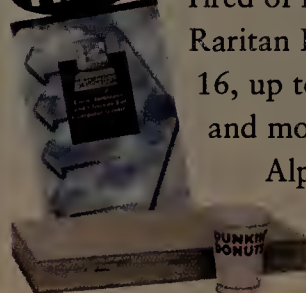
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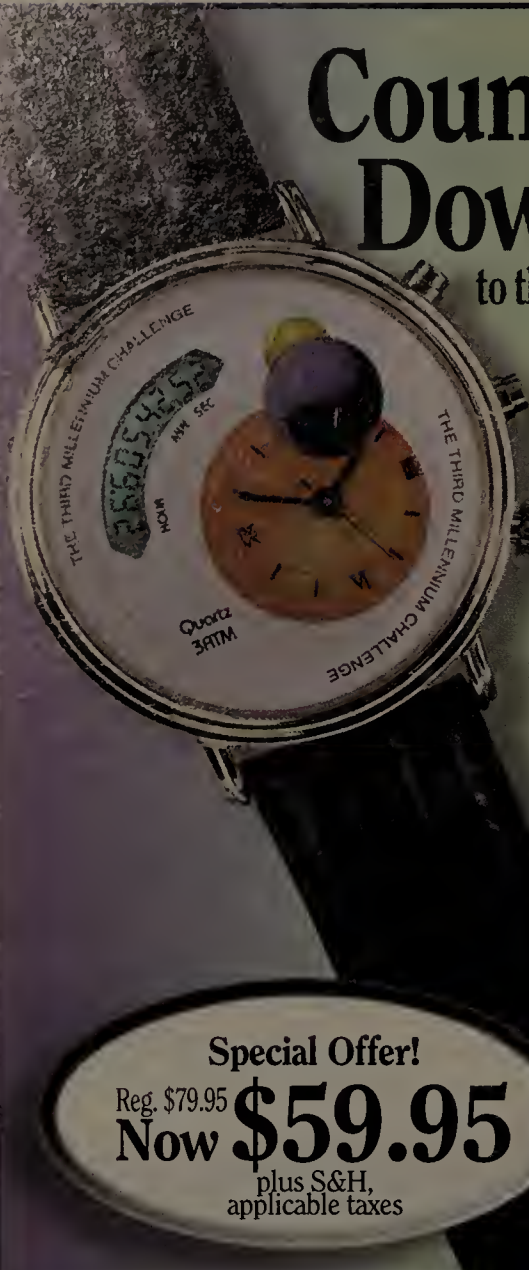
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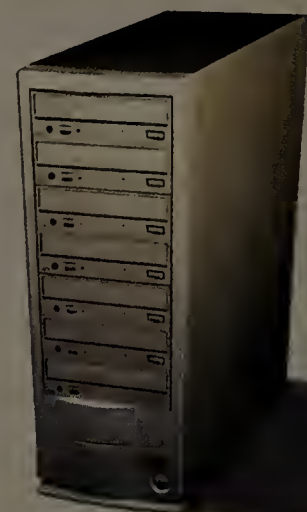
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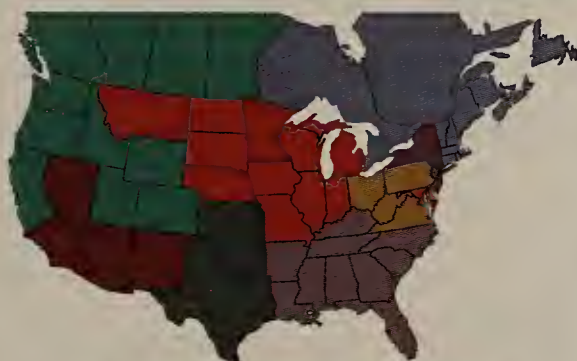
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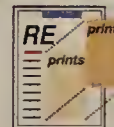
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Qwest

Continued from page 1

than AT&T. Qwest says it will offer T-3 ATM ports at about one-fourth of AT&T's price (see graphic, page 1).

To complete users' networks, Qwest can offer standard frame relay and ATM permanent virtual circuits (PVC). But the company's account representatives are pushing an alternative: switched virtual circuits (SVC).

These circuits, which larger carriers have for the most part avoided, eliminate the need to preprovision paths between network nodes. And SVCs make it possible for any corporate site to send data or voice traffic to any other site without prepaying a monthly fixed circuit charge.

For SVCs, Qwest will charge simply for the amount of traffic sent, ranging from less than 1 cent to 4 cents per megabyte across a full spectrum of eight quality-of-service classes of frame relay and ATM service (see graphic, page 65).

Despite the pricing advantage, users, analysts and Qwest officials agree the carrier faces an uphill battle to dislodge AT&T, MCI WorldCom and Sprint from enterprise accounts with long-term contracts.

"The costs are really, dramatically low," says Jim Mercer, IT director at Gerald Metals, a commodities trading and distribution company based in Stamford, Conn. "But I wouldn't jump on it right away. I'd have to do a pilot."

"The dollar amount will really pique people's interest," adds Tom Walton, president of Walton and Walton Associates, a network consultant and integrator based in Richmond, Va. "But I don't think anybody is going to just fall

over, even if they brought it in for half the price or one-third the price."

If price won't swing it, maybe expertise will. Qwest has been raiding talent from Sprint and MCI WorldCom's large base of network engineers, especially in the Washington, D.C. area near Qwest's data-services network operations center (NOC). Qwest will be heavily promoting the experience of these engineers.

nonpure IP network that Qwest is currently using to deliver enterprise services.

The Qwest frame/ATM network consists of 28 switching locations, each equipped with Ascend 500 ATM and Ascend 9000 frame relay switches, managed by Qwest technicians at NOCs here and in Dublin, Ohio.

By contrast, the IP network, consisting of 17 locations that are being outfitted with Cisco's GSR 12000 super-fast routing

PVC prices will vary accordingly. For every 8K bit/sec of committed information rate — guaranteed bandwidth that can't be squeezed if the network gets congested — users will pay \$8 per month for VFR real time, \$6 for VFR non-real time and \$4 for UFR.

The five standard types of ATM PVCs — ranging from a private-line emulation circuit known as constant bit rate (CBR) down to a best-effort cir-

relay SVCs, Qwest will provide the first 100G bytes of traffic free for each of the first three months of a service term. Those who pick ATM SVCs will get 1,000G bytes free for each of the first three months.

Several customers pointed out that because most companies would try any service before installing it, the promotion may mean that the entire first three months' usage is free except for port charges.

And part of the idea behind the promotion is to give users a chance to see their usage patterns risk-free for a few months so they're not hit with sticker shock later, Greene says.

Big advantage

Users who employ SVCs to get the free traffic may see another big advantage. Often the only traffic traveling between branch offices is voice, while data travels exclusively from branch to data center. That's not usually enough of a justification to install PVCs between branches and pay the fixed monthly fee.

So users can employ Qwest's SVCs for intracompany voice calls among branch offices without having to prepay for a branch-to-branch PVC that might not be used for anything else. And because Qwest charges by the megabyte, Greene claims that with 8K bit/sec compressed voice on Qwest's ATM service, employees can talk for 17 minutes for less than 1 cent.

For conservative users, Qwest has a traditional VPN circuit-switched voice service, which carries a traditional per-minute toll charge. But the company will let users decide whether to pay regular tolls or eliminate them by placing phone calls over the data network. Some users find that enticing.

"I think that's a better approach," says Jeff Hafer, manager of telecom engineering for GPU Energy, a power company based in Reading, Pa. "The tendency is that when a vendor is pushing you in a certain direction it has nothing else to offer." With Qwest "you feel more like there's nothing hidden behind the curtain," Hafer adds.

Supplementing the frame and ATM offers will be an SLA that offers data-throughput guarantees that vary by class of service (see graphic, this page).

But some prospective opera-

GETTING THOSE PACKETS THROUGH

Qwest's unique frame relay service-level agreements vary the data-delivery guarantee across three classes of services and offer graduated credits:

Credit level	Variable Frame Rate real time class of service	Variable Frame Rate non- real time class of service	Unspecified Frame Rate class of service
You get a 10% credit if Qwest fails to deliver:	99.98% of CIR*	99.89% of CIR*	98.49% of CIR*
15% credit:	99.90%	99.50%	98.00%
30% credit:	99.50%	99.00%	97.50%
45% credit:	99.00%	98.50%	97.00%
60% credit:	98.50%	98.00%	96.50%
75% credit:	98.00%	97.50%	96.00%
90% credit:	97.50%	97.00%	95.50%
105% credit:	97.00%	96.50%	95.00%

*Applies to traffic subscribed as "committed information rate," or with the discard-eligible bit turned off. Discard-eligible traffic has somewhat lower guarantees.

SOURCE: QWEST

IP to hype, frame to sell

From the beginning, Qwest has marketed itself as a next-generation IP carrier and has crowed about its massive 18,449-route-mile SONET network, which is capable of carrying aggregate traffic at 2.5G bit/sec OC-48 speeds now, and will be capable of 10G bit/sec OC-192 speeds in the future.

But that image has masked the fact that from a switching standpoint, Qwest really has two domestic networks — one based on IP routing and one based on frame and ATM switching. And it's the second

switches, is still a work in progress. Qwest is currently selling dedicated Internet access but does not plan dial-up access or an IP virtual private network (VPN) service until sometime next year.

Because of the dual frame relay/ATM capability, users can choose frame relay for some sites and ATM for others and still maintain a single WAN, says Mack Greene, Qwest's director of product marketing for frame relay, ATM and private lines. From the start, the network supports not only the five standard ATM service classes but also three classes of frame relay.

If a user chooses traditional frame relay PVCs, each PVC is assigned one of three classes of service. The premium type, called Variable Frame Rate (VFR) real time, takes priority over others in case of congestion, and is designed for applications such as SNA. The second type, Variable Frame Rate non-real time, takes ordinary priority and is designed for LAN interconnection. The final type, Unspecified Frame Rate (UFR), is more of a best-effort circuit for lower priority applications.

cuit known as unspecified bit rate (UBR) — will also vary in price. CBR will cost \$4.50 per month per 8K bit/sec of reserved bandwidth, while UBR will cost only 50 cents per 8K bit/sec.

Mixed blessings

But for users who are willing to choose SVCs, the prices are strictly usage-based. That can be a mixed blessing, according to some analysts.

"I have my doubts about the usefulness of either SVCs or usage-based billing," says Johna Johnson, vice president for global networking strategies at META Group, a consultancy in Stamford, Conn. "The nice thing about frame relay is that you know exactly what you're going to pay month by month."

Qwest officials acknowledge that the usage-based billing could make some users nervous. "They're concerned about the cash register being open until the end of the month," Qwest's Greene says.

To sweeten the pot, Qwest sales representatives have been given a special promotion to wave in users' faces. For customers who agree to try frame

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tional issues may trip up Qwest's efforts.

One Atlanta-area AT&T user says he's concerned that if he puts voice on Qwest frame relay or ATM SVCs, he will have difficulty figuring out how to charge the expenses back to departments. "I can't imagine what my tables would look like to charge back to my users," he says. "Part of what we've worked for with AT&T is simplification in pricing. Qwest's class-of-service and usage-based pricing doesn't do that."

A bevy of choices and a big enticement

Qwest offers seven choices of switched virtual circuits on its fast-packet services, plus a promotion for the first three months of service:

Price per megabyte of traffic sent:

Frame relay non-discard eligible:	4 cents
Frame relay discard-eligible:	3 cents
ATM constant bit rate:	2 cents
ATM variable bit rate real-time:	1.2 cents
ATM variable bit rate non-real-time:	0.75 cents
ATM available bit rate:	0.55 cents
ATM unspecified bit rate:	0.4 cents

First three months of service:

Frame relay traffic:	First 100G bytes of traffic sent free for each month
ATM traffic:	First 1,000G bytes of traffic sent free for each month

SOURCE: QWEST

Catching up

Qwest is also starting out behind the Big 3 carriers in other areas. For example, Qwest does not yet have any of its own managed-router or managed frame relay access device programs, in which the carrier takes responsibility for configuring and maintaining the user's WAN equipment.

One way Qwest hopes to catch up to the Big 3 in managed services and certain performance-monitoring activities is with an aggressive hiring program that so far has hit the big carriers where they live.

Sprint has proven a particularly fertile hunting ground for Qwest headhunters. It all started last year when Qwest hired

Paul Nemirovsky as vice president of data services, after he had spent 15 years at Sprint and its affiliates, most recently the international alliance Global One. Since then, Nemirovsky estimates that 50 to 70 employees or full-time contractors have come over to Qwest from Sprint and Global One.

Why? At Qwest "there's more appreciation of their technical skills and less of the red tape," Nemirovsky says. "There's more freedom to do what people enjoy, and see the results of their work." ■

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Don't expect Qwest local lines

Qwest may have a national network, a lot of switches, and a bunch of voice and data services, but one thing it does not have — and is not likely to have any time soon — is a plan to enter local markets.

Qwest has actually pulled back from a local telecom strategy pursued by the carrier it acquired earlier this year, LCI International.

Although LCI had not built any local networks of its own, it was reselling some services from incumbent local carriers. But after Qwest took over LCI, the president of LCI's local division — famed attorney Anne Bingaman, a former U.S. assistant attorney general who helped force Microsoft to sign a consent decree on operating systems in 1995 — left the company for private law practice.

Bingaman was not available for comment. But former LCI CEO Brian Thompson — who is now Qwest's vice chairman of the board — said that Bingaman quit after Qwest CEO Joe Nacchio made it clear that local networks weren't in his game plan.

— David Rohde

Cascade

Continued from page 1

possible, just as Cascade gear made possible many of today's public frame relay networks.

Cascade co-founder Desh Deshpande and former Cascade CEO Dan Smith are heading Sycamore Networks. Hassan Ahmed, former chief technology officer at Cascade, is president and CEO of Sonus Networks. Wu Fu Chen, a co-founder of Cascade who had already moved on to two other start-ups, is now chairman and CEO of Shasta Networks.

The three companies focus on different parts of carrier networks, from edge to core, but have one thing in common: They plan to bring to carrier networks IP features that in the past have been reserved for enterprises.

optical technologies improve, carriers can afford to adopt them quickly, Deshpande says.

Today, the biggest fiber links are achieved via dense wavelength division multiplexing (DWDM) using several different colors of laser on a single fiber. But DWDM is limited because the technology is point-to-point and lacks the intelligence to route or switch.

That kind of intelligence lies instead in underlying SONET technology. But in order to access the intelligence, fiber transmissions must be converted to electrical impulses, read, and then reconverted to optical signals for forwarding to the next node in the network.

Sycamore technology will eliminate the need for optical-electrical conversions at each node. That capability will make SONET gear unnecessary in

that can complete calls to and from the existing circuit switched public telephone network. And existing phone companies can start building IP backbones for voice and data without isolating existing networks.

In addition, Sonus gateways will sport APIs that will let carriers quickly provision new types of services. Today, interfaces to switches are proprietary, making development of service-enabling software costly, says Rubin Gruber, founder of Sonus.

Shasta on the edge

Shasta plans to push provisioning intelligence and bill tracking abilities to the edge of carrier IP networks, says Anthony Alles, president of Shasta. In addition, Shasta gear will break services into discrete elements that can be combined to create custom

CASCADE: THE NEXT GENERATION

Three start-ups are relying on former top figures at Cascade Communications.

Company	Shasta Networks	Sonus Networks	Sycamore Networks
Headquarters	Sunnyvale, Calif.	Westford, Mass.	Tewksbury, Mass.
Founded	March 1998	August 1997	February 1998
Funding	\$5.5 million from Benchmark	\$23 million from Bedrock, Charles River Ventures, Matrix Partners, NorthBridge Venture Partners and Bessemer Venture Partners	\$20 million from Matrix Partners, NorthBridge Venture Partners and private funding
Employees	48	50	50
Products	IP service provisioning hardware/software platform and management system	Sonus Gateway Switch, voice/data carrier gear	Intelligent optical backbone gear, as yet unnamed
Competitors	Cisco, Redstone, Redback	Ascend, 3Com	Lucent, Nortel Networks
Fun fact	Company name comes from Mt. Shasta, the tallest peak in the California Cascade range.	Company occupies the former Cascade headquarters.	Key company milestones are marked by ethnic feasts. So far, Chinese and Indian food extravaganzas have been held, with Greek cuisine next on the menu.

Sycamore at the core

Sycamore is focused on the optical fiber at the core of carrier networks, where the company will introduce intelligence into the gear that moves packets over the fiber, Deshpande says.

The company hopes to open so much bandwidth on fiber-optic strands that bottlenecks will not occur in carrier backbones. This means carriers will be able to more easily offer IP services with guaranteed quality of service. And Sycamore gear will provide that bandwidth economically, so that as

new networks, cutting one of the underlying costs of services, the company claims.

Sonus blends old and new

Sonus is working on an IP switch that can talk to current telephone switches and use existing telephone signaling to direct traffic over IP networks. It can also convert IP destination routing into telephone signals that can be understood by phone companies' circuit switches.

With these signals operational, new providers can set up voice/data IP networks

services, he says.

For example, a technician could pull together authentication, encryption and authorization elements to support a virtual private network service. These types of elements can also be mixed and matched in various ways to fashion custom services, Alles says.

Shasta's gear will also track key billing data so carriers can charge based on usage. ■

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Etiquette, monkeys and the Internet

"Manners Maketh The Man"

— Motto inscribed above the gate of The Skinner's School in Tunbridge Wells, England

I just got a voice mail message from one Ken Baker. Mr. Baker, who I assume to be a faithful reader, took exception to a comment I made in my Nov. 23 column, "Throwing them into the black hole."

The column concerned Network Solutions, Inc. (NSI) and its use of spam. My comment was: "This is very bad thinking on the part of NSI and demonstrates a profound ignorance of Internet etiquette."

Mr. Baker's voice mail accused me of "missing the point" because I suggested that Internet etiquette mattered. His point was "the Internet is a medium. There is no etiquette upon the phone lines, no etiquette of the cable lines . . . there's no etiquette on the broadcast television medium." Mr. Baker further considers that "it is an elitist point of view that makes you believe that there is a [necessity for etiquette on the Internet]."

I have recently heard people express a similar view. The idea that etiquette is irrelevant on the 'Net or anywhere else is amazingly wrong and a fundamentally uncivilized position. Let's consider what etiquette means.

Etiquette: accepted or prescribed forms of behavior, courtesies and ceremonies in society or a profession.

Get it? "Behavior," "courtesies" and "society" are the keys here. Once you let courtesies go, you allow for and create conflict and aggression. In a discourteous environment, every contact is an imposition and all exchanges become confrontational. Society becomes uncivilized.

Want to see what kind of environment this creates? Go to New York. I have seen the most amazingly rude and aggressive behavior in New York, and it is because people there

tend to dispense with the courtesies.

The same applies in network environments. Look at what happens on corporate nets when people forget to be courteous — flame wars. I spoke to a friend who is the president of a large company. He said he has to break up e-mail battles between staff on a regular basis.

What is interesting about these battles is that they would hardly ever occur if the combatants were face-to-face. This is a direct result of our monkey heritage (sorry to all the creationists out there). Just being physically near each other makes

you more polite (a million years of evolution is whispering in your ear, "The other monkey might be concealing a club" . . . you can never be too careful).

Mr. Baker went on to opine that the Internet "is a medium to be exploited by those that can, [and while] I don't necessarily agree with all the ways . . . it is American capitalism." I couldn't agree more. But why should that preclude courtesy?

In the case of NSI, it has to have been aware of the prevailing attitude about unsolicited bulk e-mail (UBE). People don't like it; it's that simple. People consider UBE to be intrusive and, by implication, impolite. And yes, you can distribute spam, and you may only get a handful of complaints. But those who complain will be just a small percentage of those who are annoyed, and creating a large population of people who are offended with you is normally considered bad business.

Etiquette and its foundations — politeness and courtesy — are not ideas to be tossed aside lightly. If you do toss them aside, make sure you know how all us monkeys will react and how that reaction will affect you and, ultimately, your business. After all, we might just meet face-to-face some day.

Confrontations to nwcolumn@gibbs.com or (800) 622-1108, Ext. 7504.



Mark Gibbs



The latest on the Internet/intranet industry

THERE'S NO BUSINESS LIKE TRADE SHOW BUSINESS Pam Klier told as many people as would listen at last week's **Java Business Expo** in New York all about how Computer Associates' object-oriented Jasmine database would help transform networks into multimedia application development powerhouses.

Well, she wasn't exactly *telling* people. Klier and three partners were **belting out a swing-style song/dance/pitch bit** on a small stage fronting the CA booth at the Javits convention center.

Sample lines: "Let's get down with the latest Web innovations" and "Jasmine gives you total enterprise management."

It's not the kind of stuff you'd normally catch on the radio, though I once heard Ella Fitzgerald singing something about "heterogeneous server connectivity." But I think she was just scatting.

Klier is not a multitasking chief technology officer, but rather an actress, singer and dancer who is paid by corporations to promote their products at trade shows. The 31-year-old works through **Live Marketing**, a production company based in Chicago, her hometown.

"Trade shows are a great way for an actor to make a living," says Klier, who does two or three shows per month.

For anywhere from \$500 to \$1,200 per day, Klier and other trade-circuit veterans will do a 7- to 10-minute performance about a dozen times per day.

Live Marketing employs writers who prepare scripts for its clients, many of which are medical or high-tech companies. (The week before the Java show, Klier performed for enterprise resource management applications vendor Epiphany at the Sales Force Automation Conference and Expo in Boston.)

While Klier and her partners may not be called upon to spearhead a data synchronization project across multiple database platforms, they do have to be quick studies. "We can have anywhere from two weeks to one hour of prep time to learn a script," she says.

After a few rehearsals, it's time to don the greasepaint — or at least a vendor T-shirt — and work the ever-flowing crowd.

Between sets, Klier and other performers wander around convention center floors, running into acquaintances and perusing technologies they may someday be jitterbugging to.

Somnambulistic CEOs and listless marketing execs could learn a couple of things from performers such as Klier:

- 1) A well-timed leg kick never hurt a PowerPoint presentation.
- 2) Success in getting your message across can be boiled down to two words: Sell it, baby!

OK, that's three words, but this is all about feeling, not math.

IT TAKES A VILLAGE TO RAISE A PROGRAMMING LANGUAGE With only about 200 exhibitors encamped in the cavernous Javits building, the **Java Business Expo** felt more like a small village than a teeming metropolis, a la Internet World. But it was nice to walk up and down the aisles and **recognize almost every company**.

Still, there were a handful of Java start-ups with which *'Net Buzz* was unfamiliar. Here are three of them, along with what they do:

- **Instantiations, Inc.** of Tualatin, Ore., provides services and technologies, such as the JOVE run-time compiler, designed to improve the performance of large Java applications.
- **SlangSoft, Ltd.** of Ramat Gan, Israel, sells applications that allow users to do e-mailing, chatting and word-processing in any national language.
- **Caribou Lake Software** of Minneapolis offers software and services for accessing relational databases with Java.

I'd like to close this column with a little number I like to call "Send Your Best Internet-related News, Gossip and Sheet Music to 'Net Buzz." It's a torch song. Contact Chris Nerney at (508) 820-7451 or cnerney@nwu.com.

Chris Nerney

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